Fig. 1

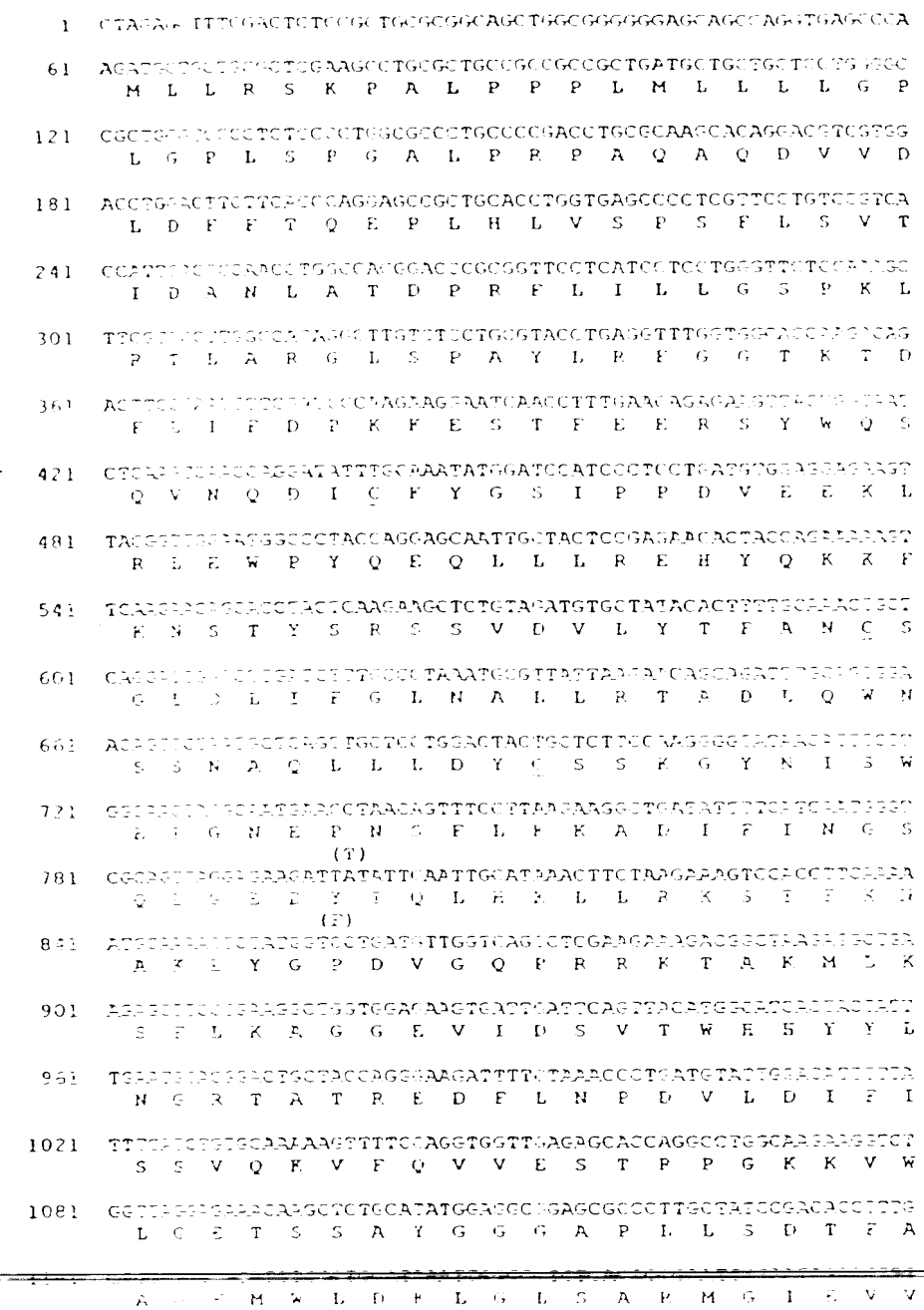
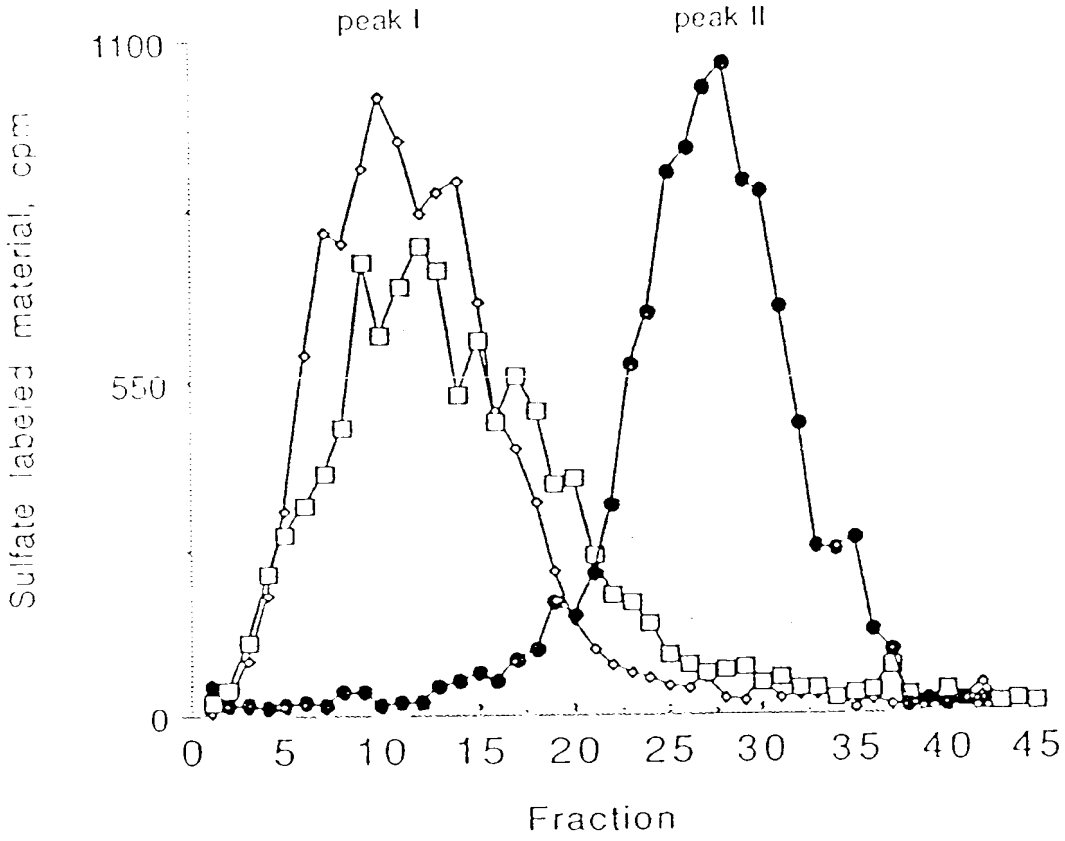


Fig. 2


peak I
peak II
1100
550
0
Sulfate labeled material, cpm
0
5
10
15
20
25
30
35
40
45
Fraction

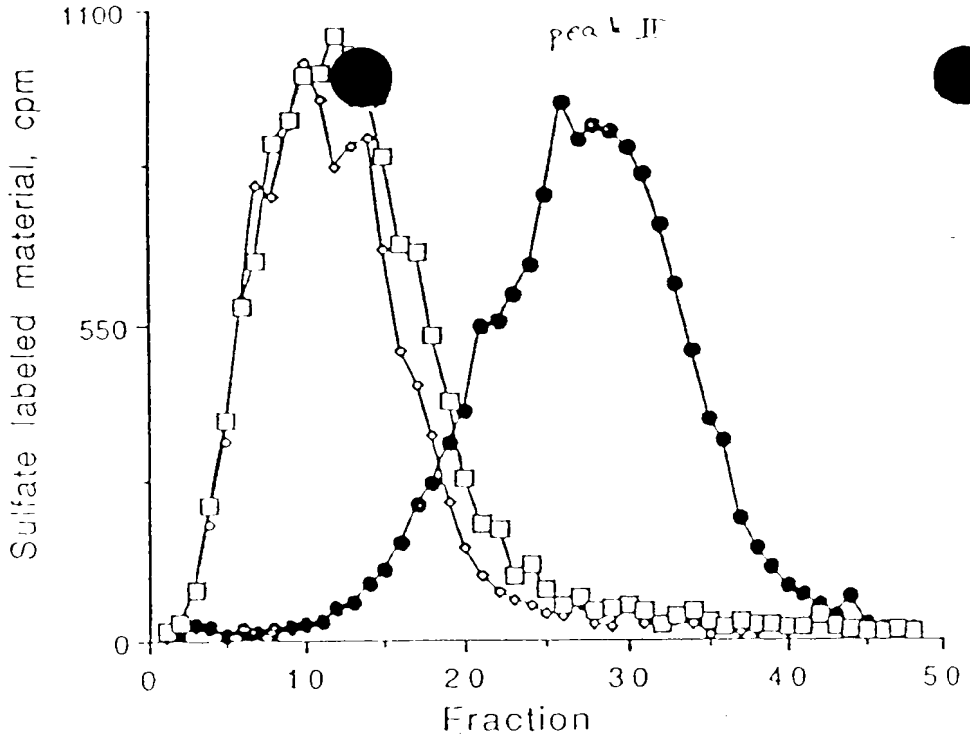

peak II
1100
550
0
Sulfate labeled material, cpm
0
10
20
30
40
50
Fraction

Fig. 3A

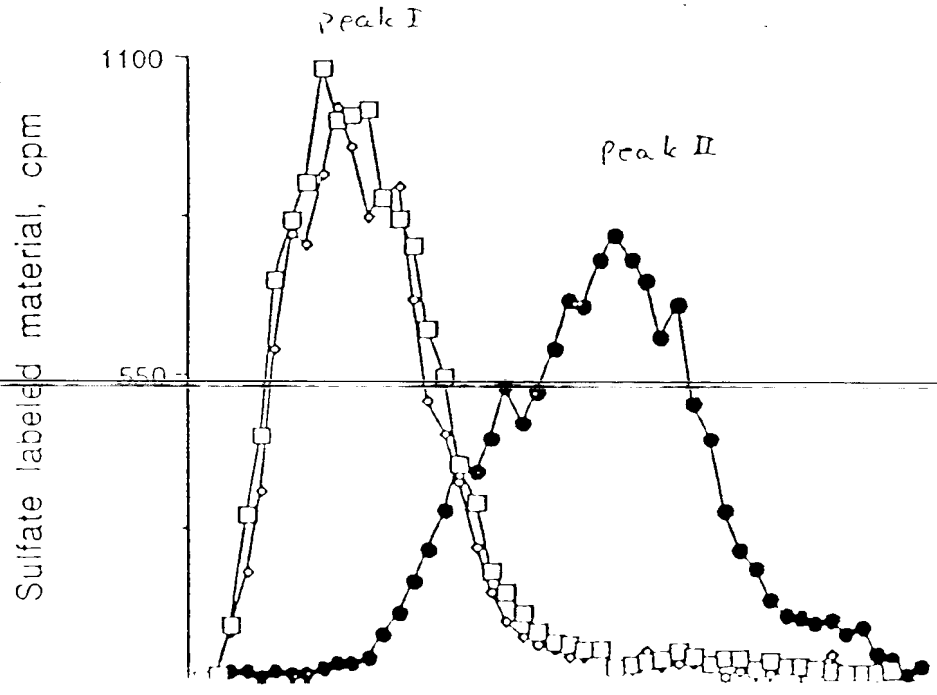
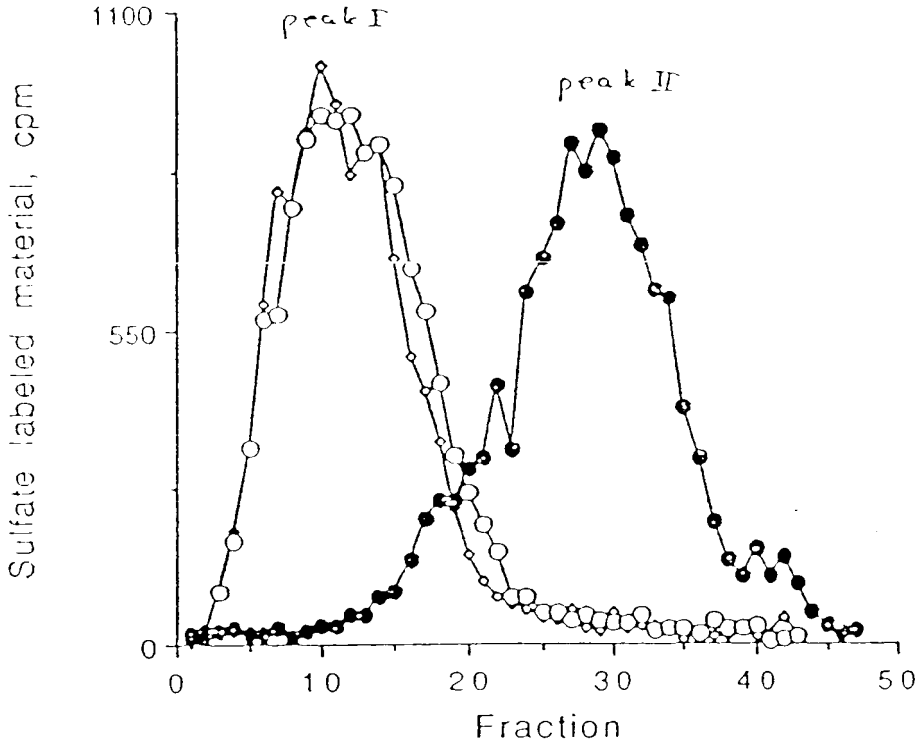

Peak I
1100
Peak II
550
Sulfate labeled material, cpm

Fig. 3B

Fig. 4


peak I
peak II
1100
550
0
Sulfate labeled material, cpm
0
10
20
30
40
50
Fraction

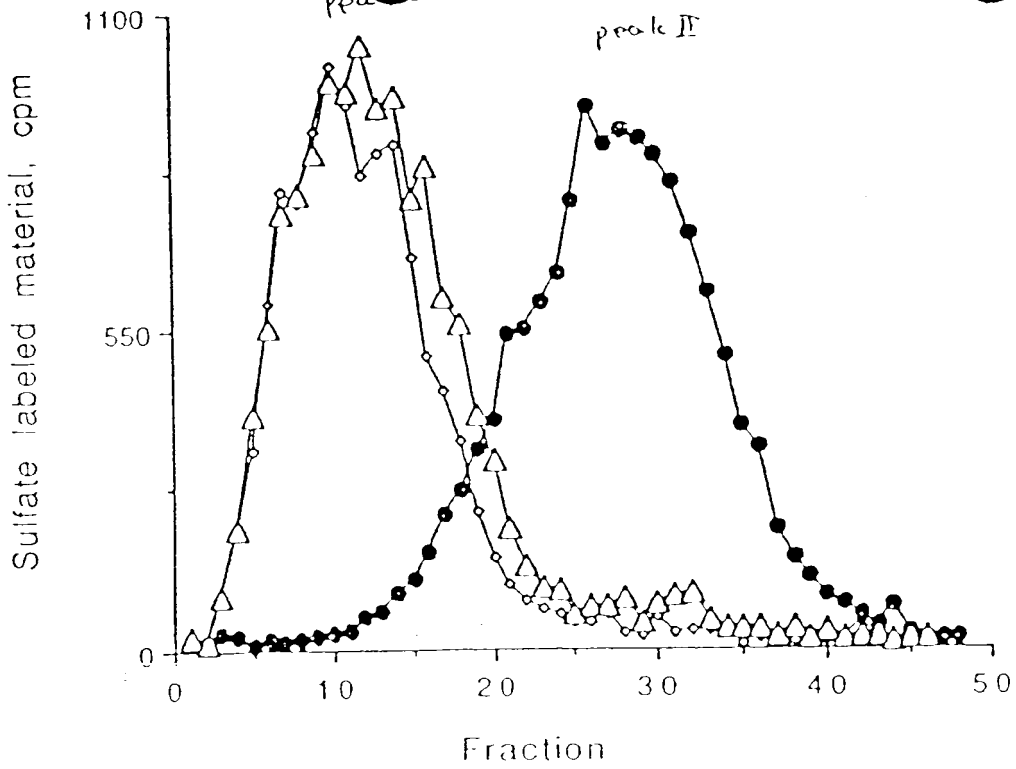
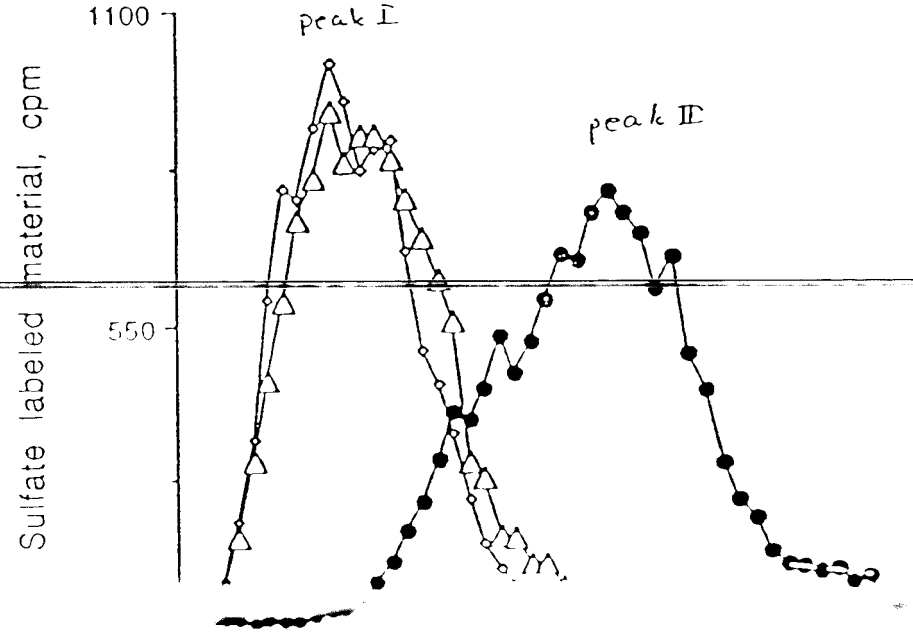

peak I
peak II
1100
550
0
Sulfate labeled material, cpm
0
10
20
30
40
50
Fraction

Fig. 5A


1100
peak I
peak II
550
Sulfate labeled material, cpm
Fraction

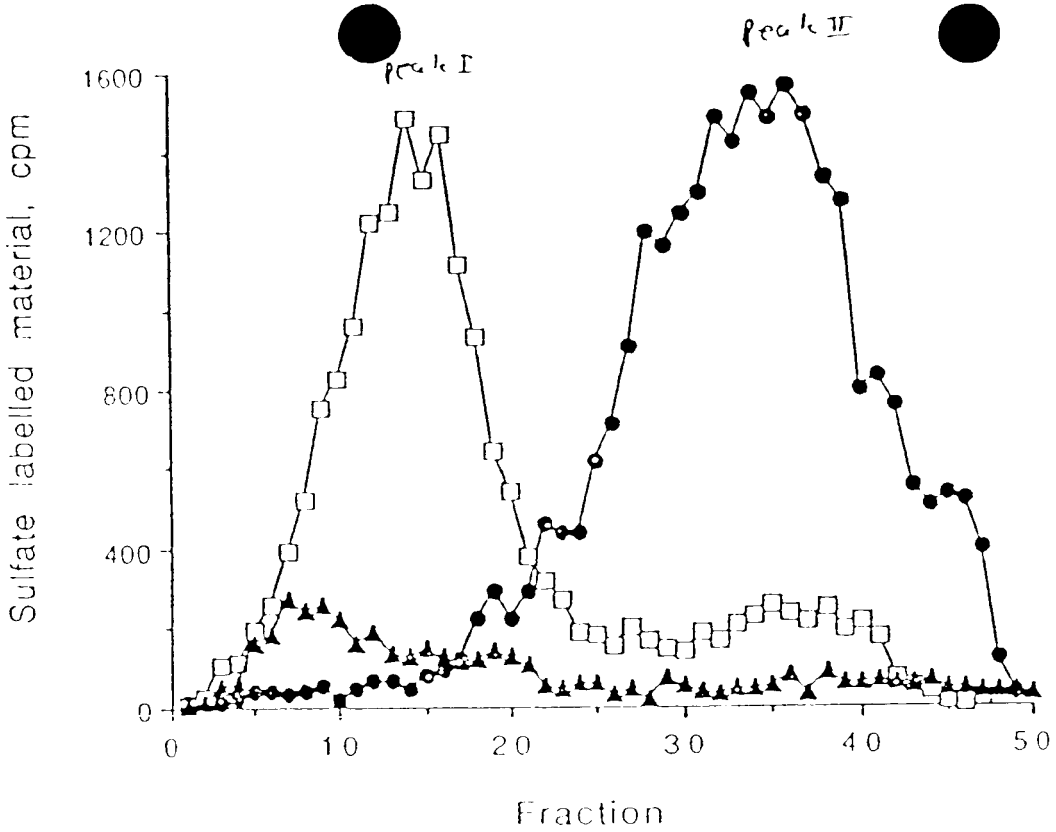
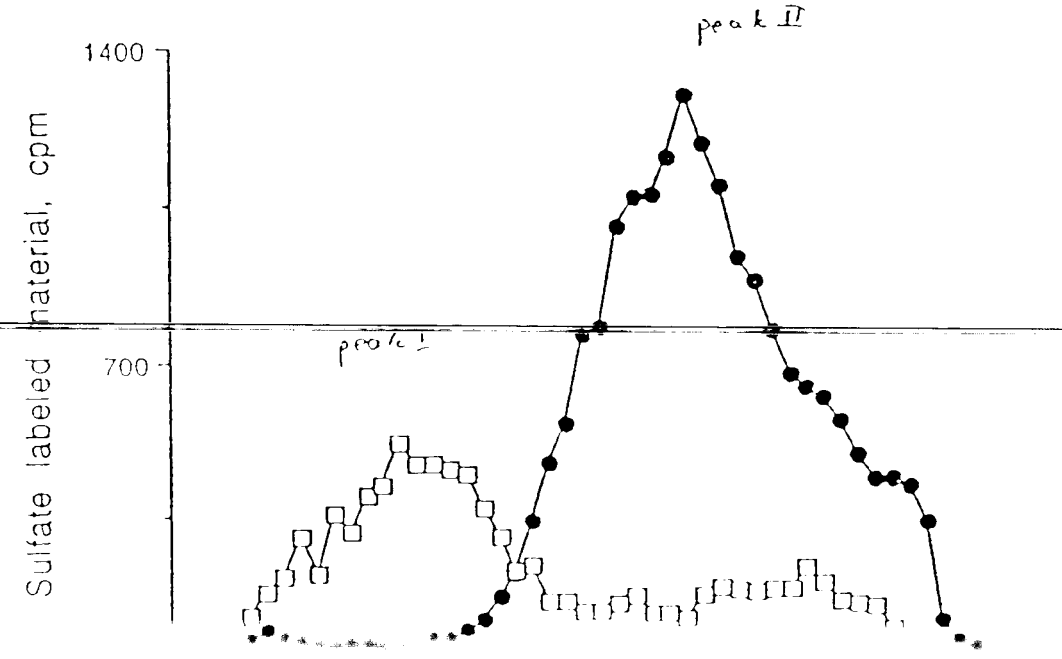


Fig. 6A



Fraction

Fig. 6B

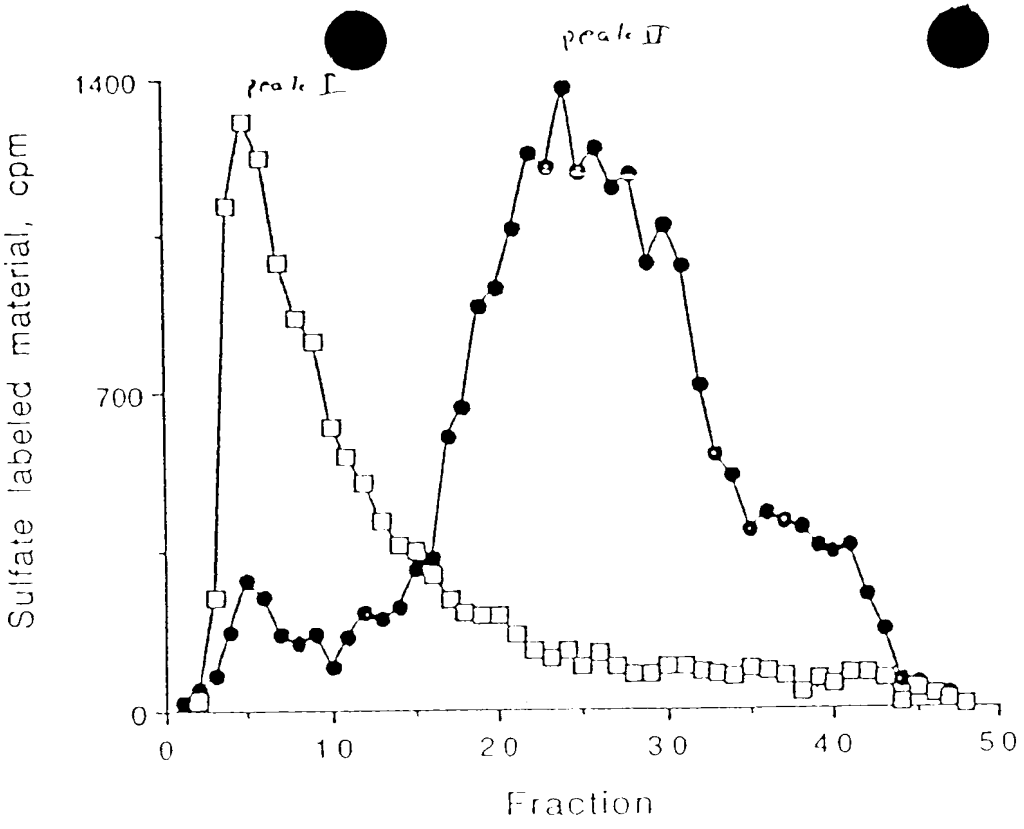
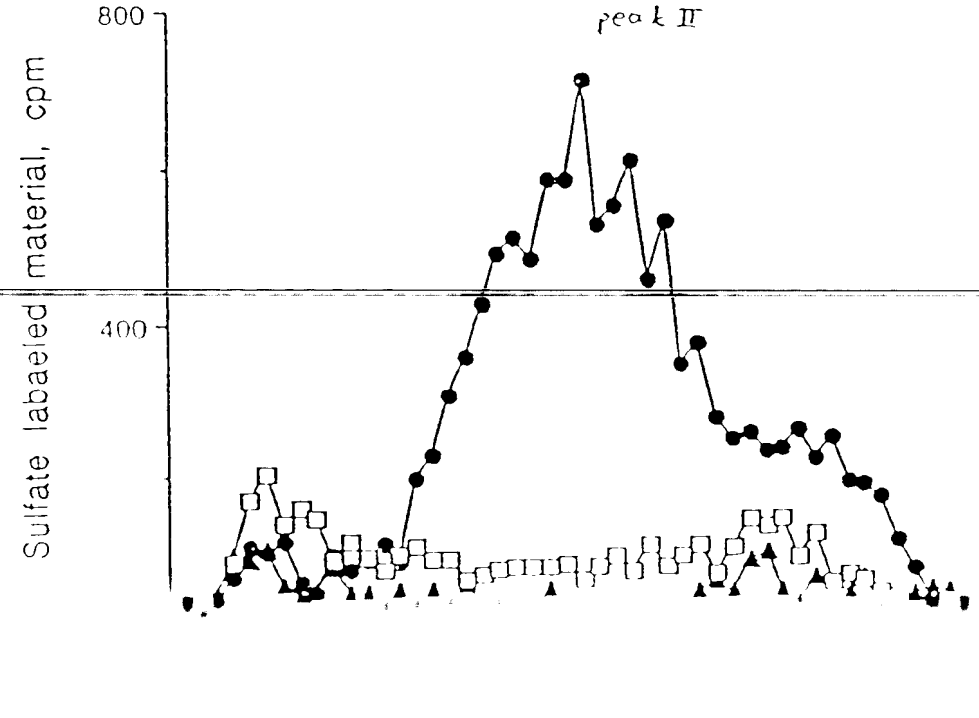

peak II
peak I
1400
700
0
Sulfate labeled material, cpm
0
10
20
30
40
50
Fraction

Fig. 7A


800
400
peak III
Sulfate labaeled material, cpm
Fraction

(Fig. 7B)

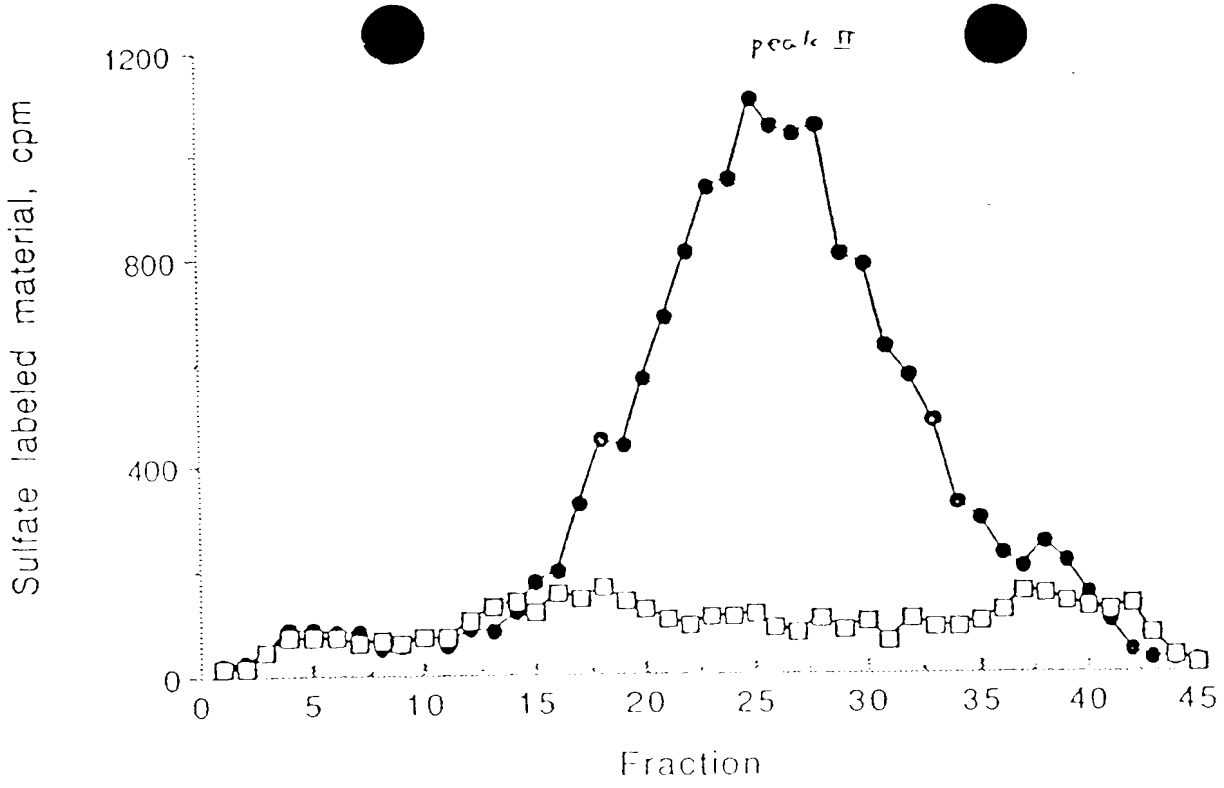
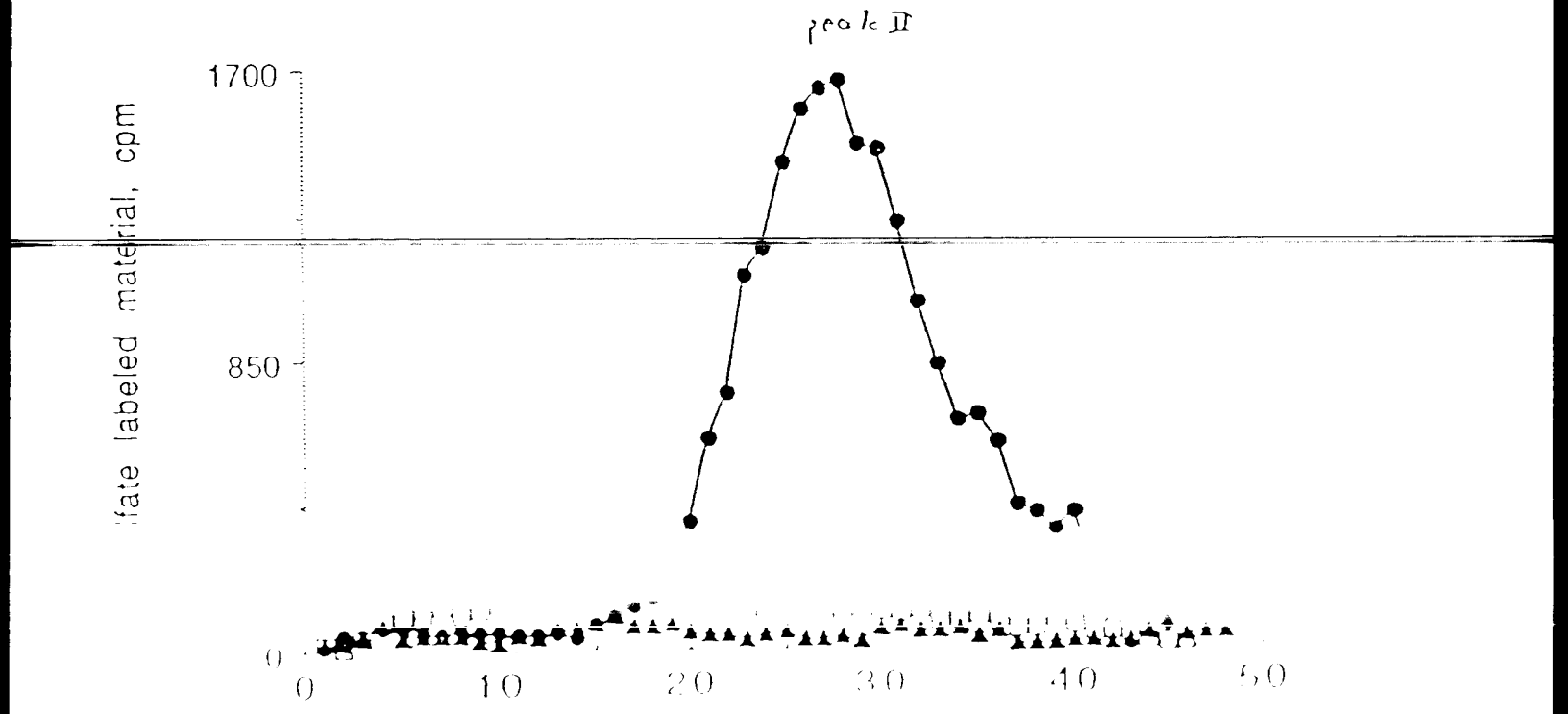

peak II
1200
800
400
0
Sulfate labeled material, cpm
0
5
10
15
20
25
30
35
40
45
Fraction

Fig. 8A


peak II
1700
850
0
0
10
20
30
40
50

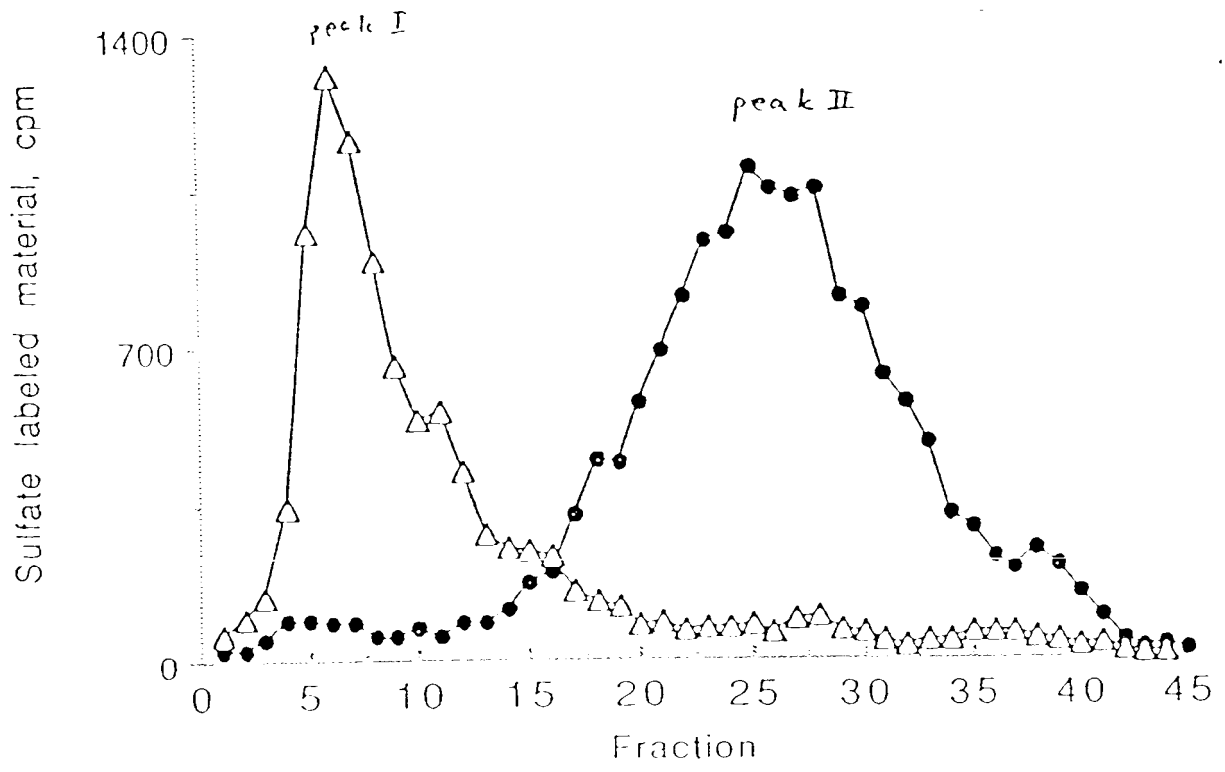
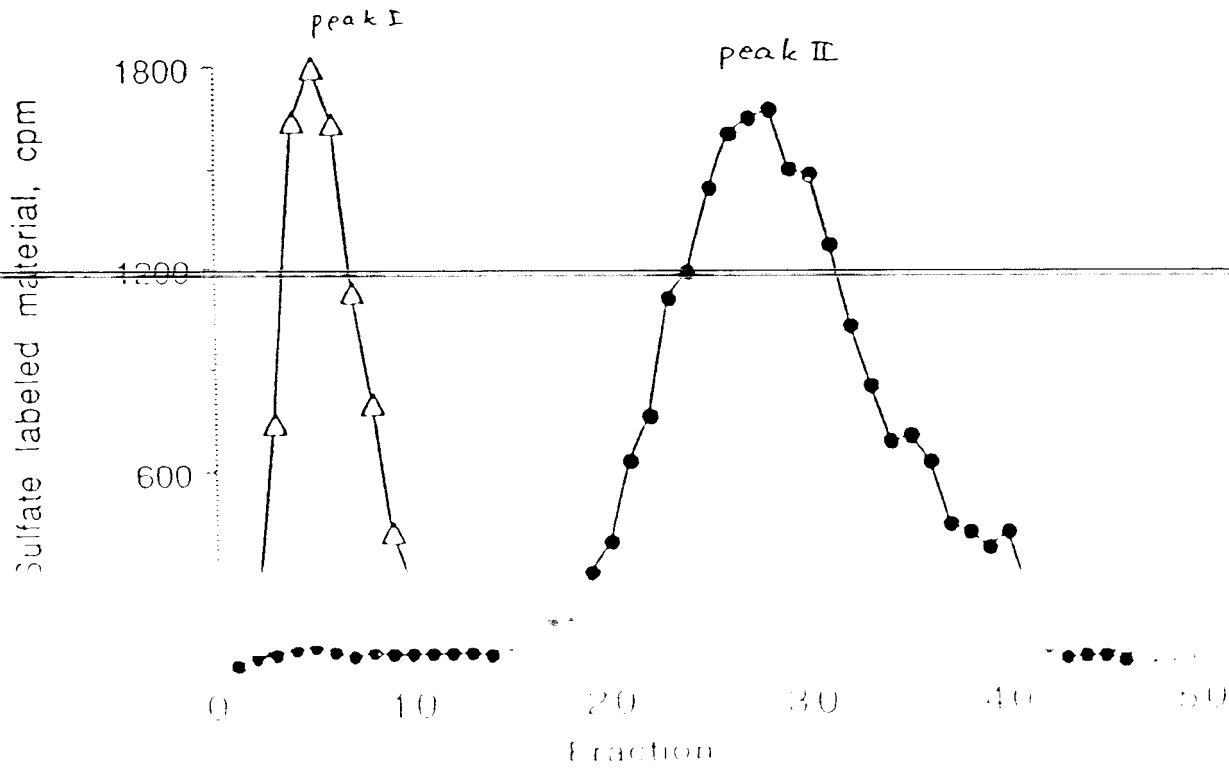
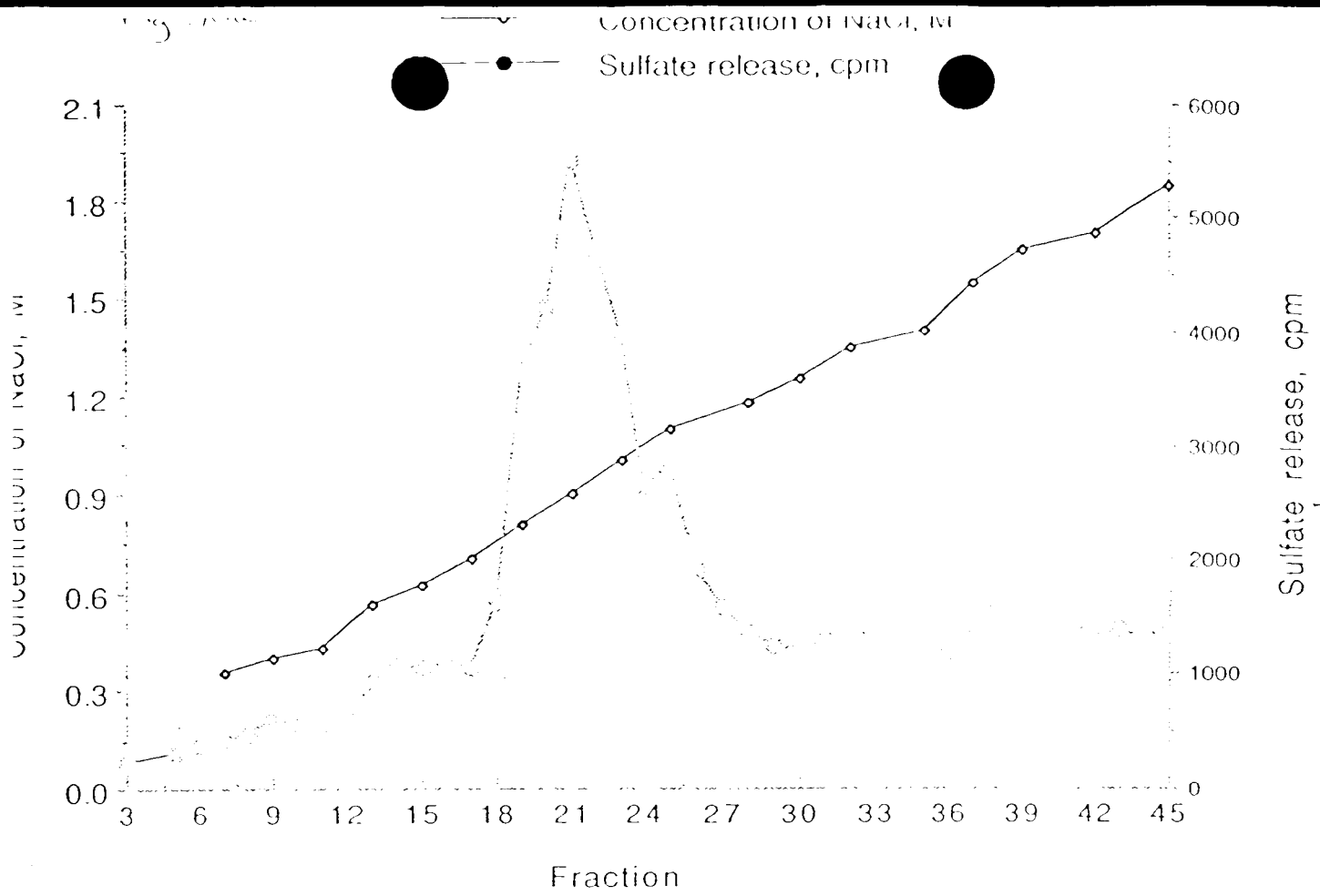

peak I
peak II
1400
700
0
Sulfate labeled material, cpm
0 5 10 15 20 25 30 35 40 45
Fraction

Fig. 9A


peak I
peak II
1800
600
Sulfate labeled material, cpm
0 10 20 30 40 50
Fraction


Concentration of NaCl, M
Sulfate release, cpm
2.1
1.8
1.5
1.2
0.9
0.6
0.3
0.0
6000
5000
4000
3000
2000
1000
0
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45
Fraction

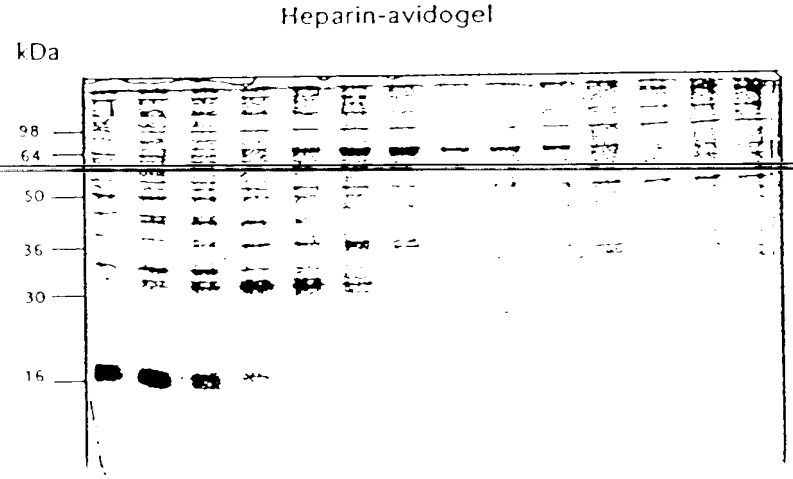

Heparin-avidogel
kDa
98
64
50
36
30
16

Fig. 10b

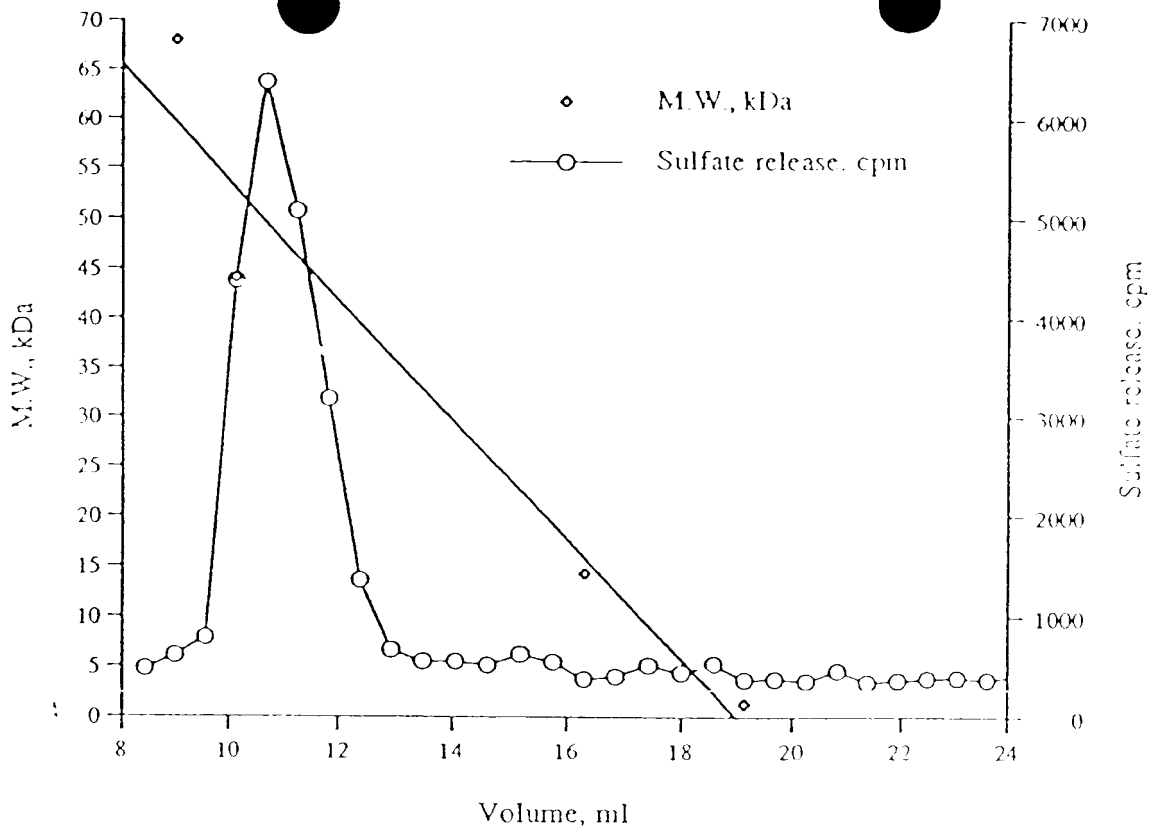


Fig. 11a

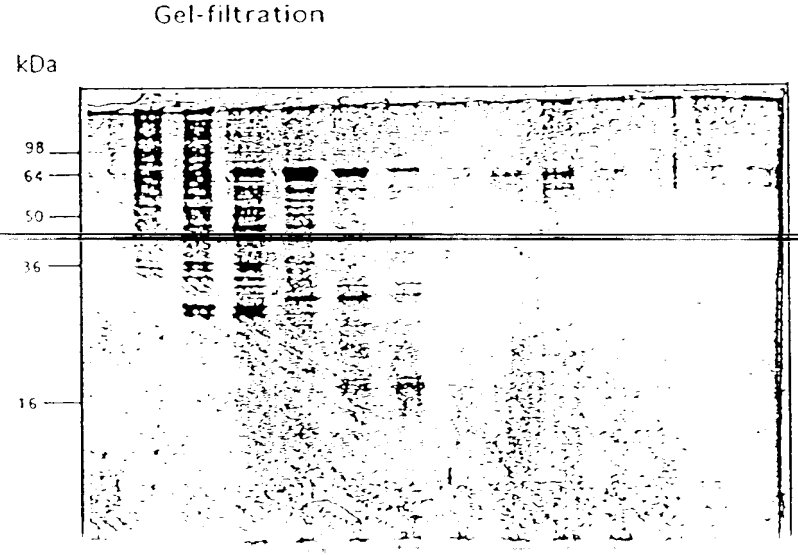
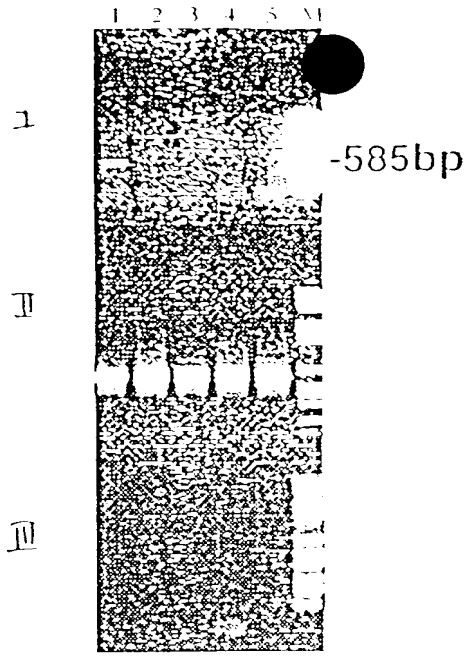
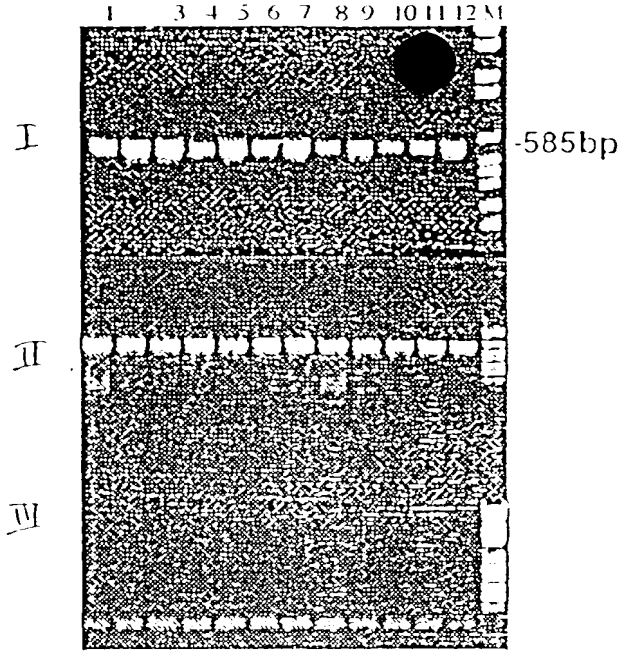


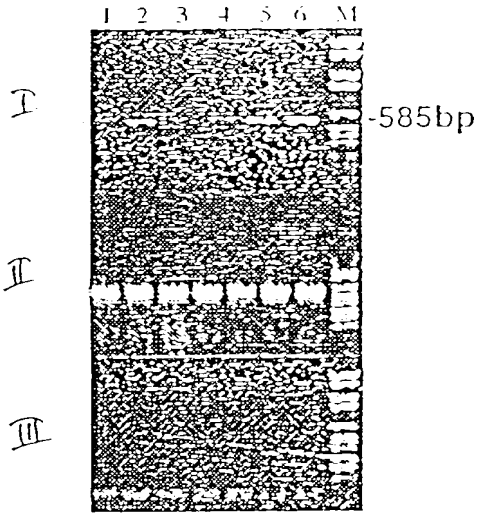
Fig. 11b


1 2 3 4 5 M
I
II
III
-585bp

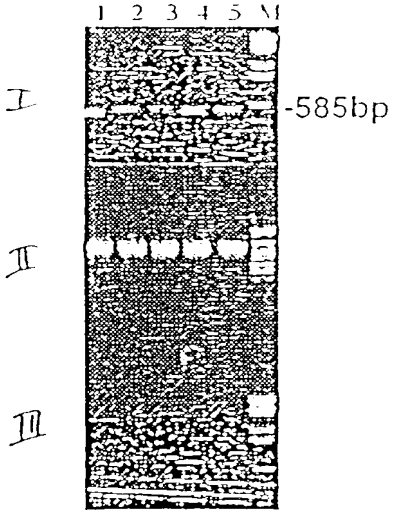
A


1 3 4 5 6 7 8 9 10 11 12 M
I
II
IV
-585bp

B


1 2 3 4 5 6 M
I
II
III
-585bp

C


1 2 3 4 5 M
I
II
III
-585bp

D

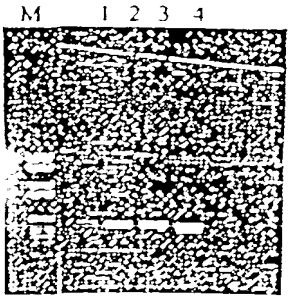

M 1 2 3 4

Fig 13

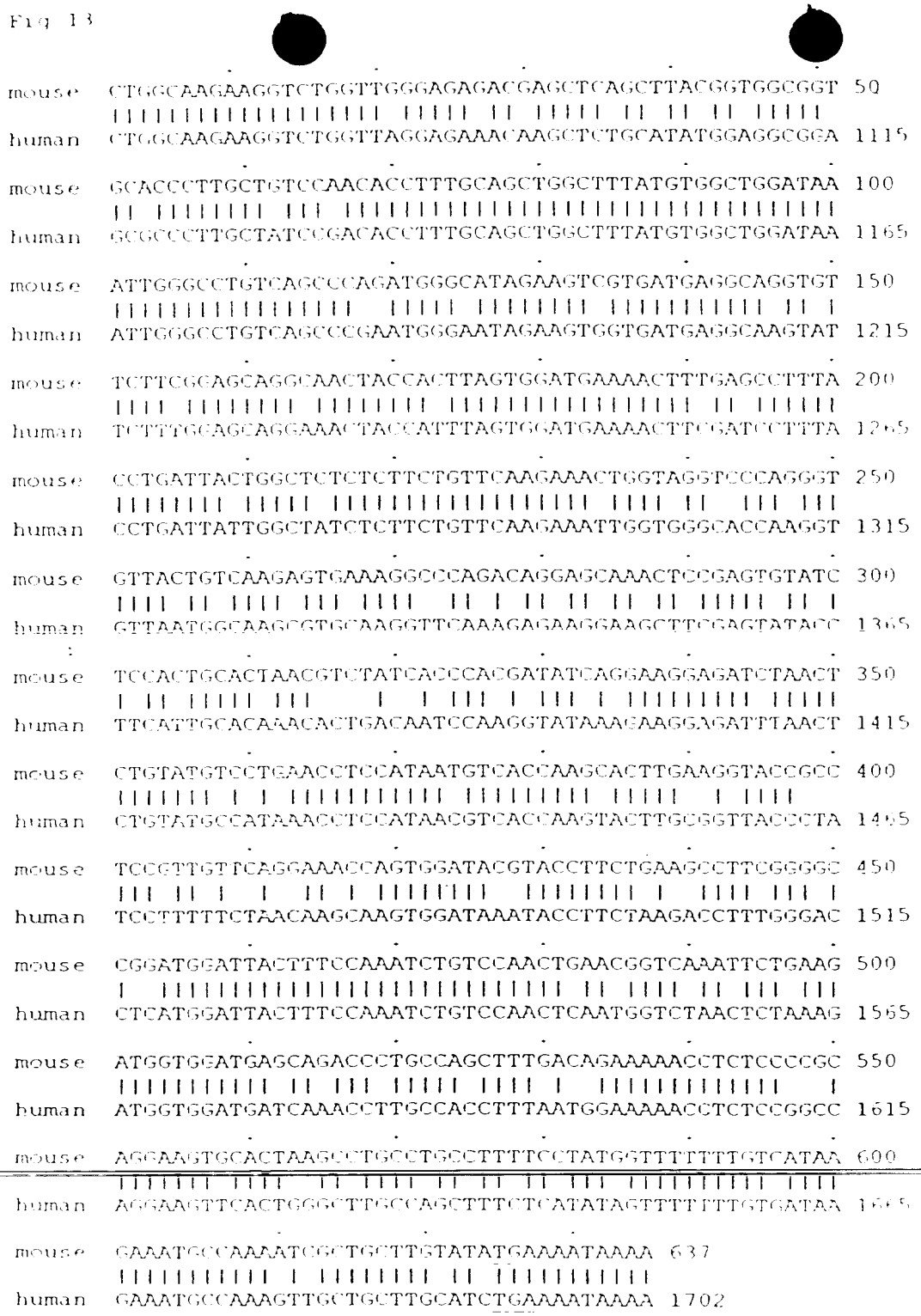

mouse CTGGCAAGAAGGTCTGGTTGGGAGAGACGAGCTCAGCTTACGGTGGCGGT 50
human CTGGCAAGAAGGTCTGGTTAGGAGAAACAAGCTCTGCATATGGAGGCGGA 1115
mouse GCACCCTTGCTGTCCAACACCTTTGCAGCTGGCTTTATGTGGCTGGATAA 100
human GCGCCCTTGCTATCCGACACCTTTGCAGCTGGCTTTATGTGGCTGGATAA 1165
mouse ATTGGGCCTGTCAGCCCAGATGGGCATAGAAGTCGTGATGAGGCAGGTGT 150
human ATTGGGCCTGTCAGCCCGAATGGGAATAGAAGTGGTGATGAGGCAAGTAT 1215
mouse TCTTCGCAGCAGGCAACTACCACTTAGTGGATGAAAACTTTGAGCCTTTA 200
human TCTTTGCAGCAGGAAACTACCATTTAGTGGATGAAAACTTCGATCCTTTA 1265
mouse CCTGATTACTGGCTCTCTCTTCTGTTCAAGAAACTGGTAGGTCCCAGGGT 250
human CCTGATTATTGGCTATCTCTTCTGTTCAAGAAATTGGTGGGCACCAAGGT 1315
mouse GTTACTGTCAAGAGTGAAAGGCCCAGACAGGAGCAAACTCCGAGTGTATC 300
human GTTAATGGCAAGCGTGCAAGGTTCAAAGAGAAGGAAGCTTCGAGTATCC 1365
mouse TCCACTGCACTAACGTCTATCACCCACGATATCAGGAAGGAGATCTAACT 350
human TTCATTGCACAAACACTGACAATCCAAGGTATAAAGAAGGAGATTTAACT 1415
mouse CTGTATGTCCTGAACCTCCATAATGTCACCAAGCACTTGAAGGTACCGCC 400
human CTGTATGCCATAAACCTCCATAACGTCACCAAGTACTTGCGGTTACCCTA 1465
mouse TCCGTTGTTCAGGAAACCAGTGGATACGTACCTTCTGAAGCCTTCGGGGC 450
human TCCTTTTTCTAACAAGCAAGTGGATAAATACCTTCTAAGACCTTTGGGAC 1515
mouse CGGATGGATTACTTTCCAAATCTGTCCAACTGAACGGTCAAATTCTGAAG 500
human CTCATGGATTACTTTCCAAATCTGTCCAACTCAATGGTCTAACTCTAAAG 1565
mouse ATGGTGGATGAGCAGACCCTGCCAGCTTTGACAGAAAAACCTCTCCCCGC 550
human ATGGTGGATGATCAAACCTTGCCACCTTTAATGGAAAAACCTCTCCGGCC 1615
mouse AGGAAGTGCACTAAGCCTGCCTGCCTTTTCCTATGGTTTTTTTGTCATAA 600
human AGGAAGTTCACTGGGCTTGCCAGCTTTCTCATATAGTTTTTTTGTGATAA 1665
mouse GAAATGCCAAAATCGCTGCTTGTATATGAAAATAAAA 637
human GAAATGCCAAAGTTGCTGCTTGCATCTGAAAATAAAA 1702

Fig. 14

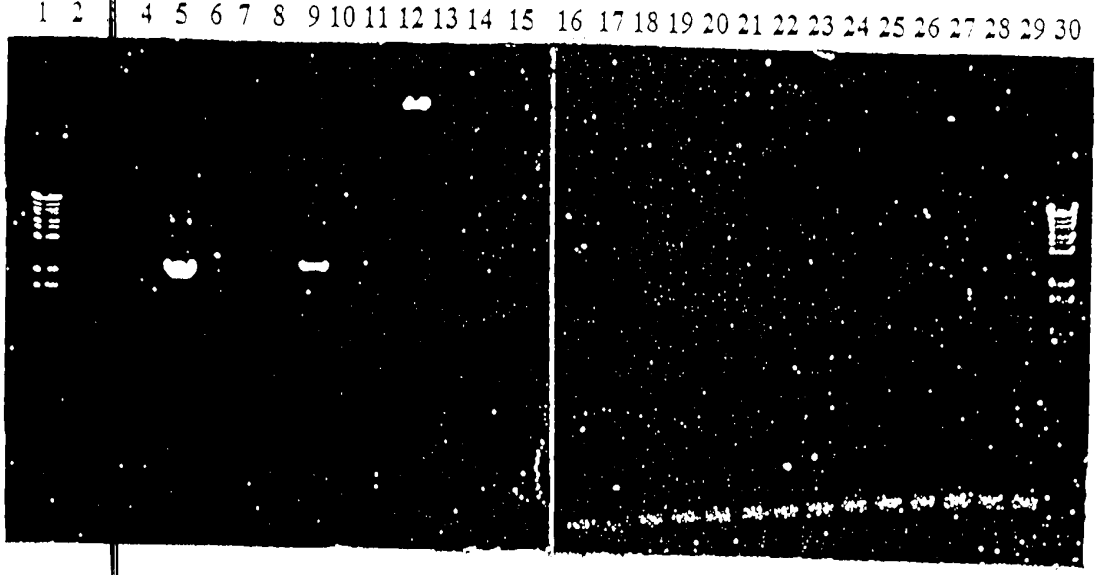
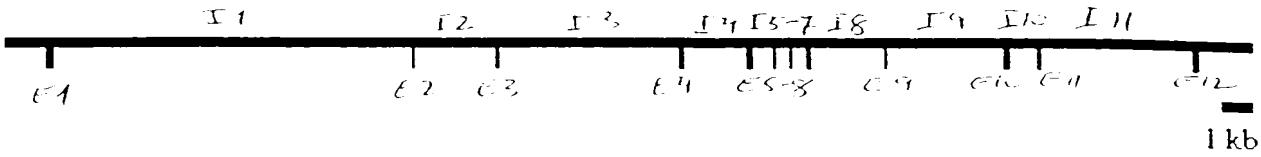

1 2 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Figure 15



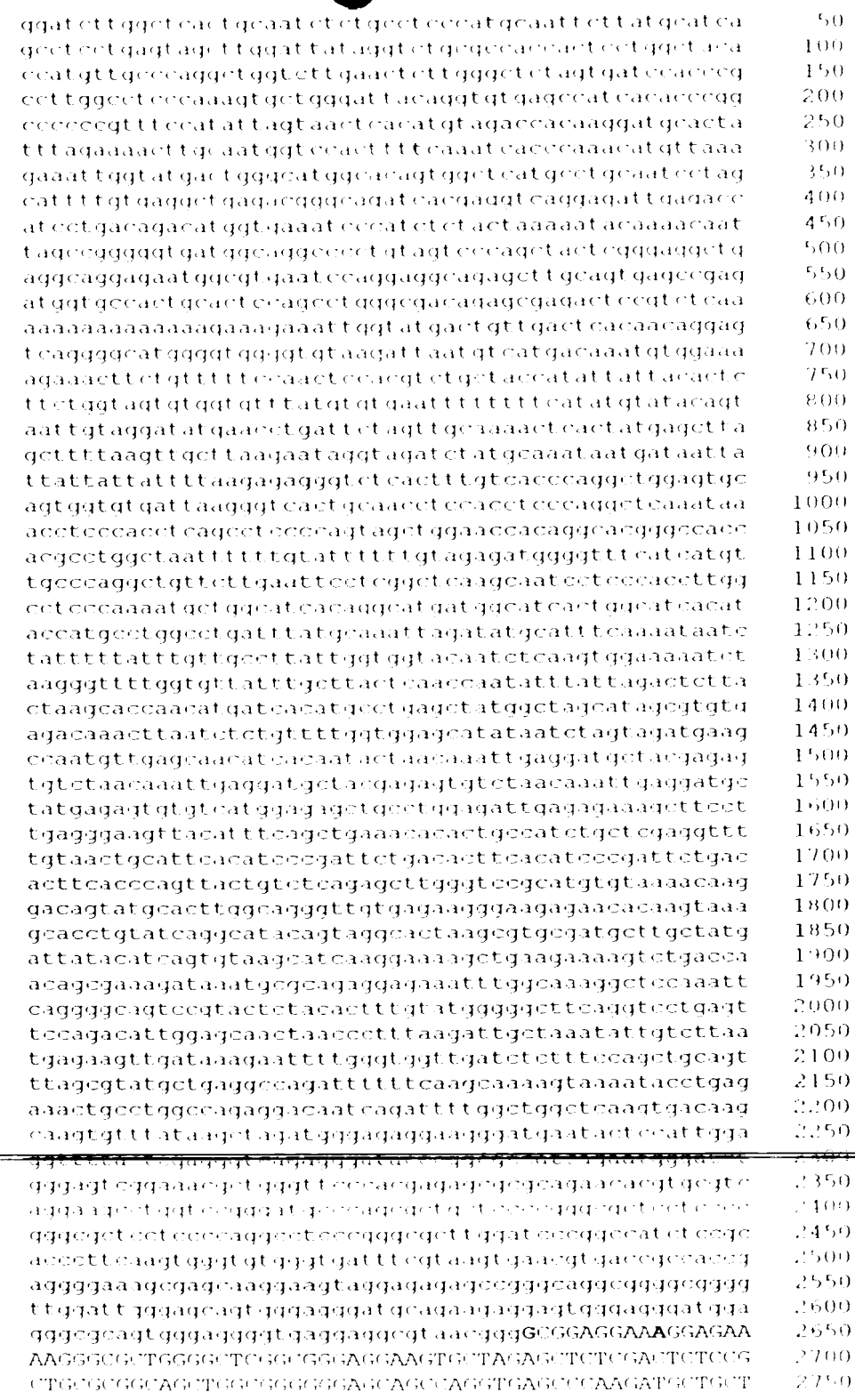
Lambda 8

Lambda 6

Plasmid

Lambda 3

Figure 16



P L G P L S P G A L P R P A Q A Q
GACGTCGTGGACCTGGACTTC[illegible]CCCAGGAGCCGCTGCACCTGGTGAG 2900
D V V D L D F [illegible] T Q E P L H L V S
CCCCTCGTTCCTGTCCGTCACCATTGACGCCAACCTGGCCACGGACCCGC 2950
P S F L S V T I D A N L A T D P
GGTTCCTCATCCTCCTGGGgtaagcgccagcctcctggtcctgtcccctt 3000
R F L I L L G
tcctgtcctcctgacacctatgtctgccccgccagcggctctccttcttt 3050
tgcgcggaaacaacttcacaccggaacctccccgcctgtctctccccacc 3100
ccacttcccgcctctcattctccctctccctcccttactctcagacccca 3150
aaccgcttttgggggtatcatttaaaaatagatttaggggttacaag 3200
tgcagttctgttccatgggtatattgcattgtggtggcatctgggctctt 3250
agtgtaactgtcacccgaatgttgtacattgtatctaataggtaatttct 3300
catccctcatccctctcccacccctcccacctttggagtctccagtgtct 3350
actattccactaagtccatgtgtacacattgtttagcgcccactctaaat 3400
gagcctttttgtttcattcattctgtaagtgttgaataggcacccacctaa 3450
ggtcaggtataagtggaaatttgaaaaagaaactgcccacttgcccagt 3500
acttccctagccaagaggagggaaaccaggcaggtgcacctgaaggcctg 3550
tgagtgcttgatttgctgtgcagtgtaggacaagtaagattgtgcatagc 3600
cttctgtatttaagactgtgttaggaagatttctctttctttttcttttct 3650
ttttcttttttcttttcttttttttttttaggcagatgaaaagggcgtca 3700
cagaacaggaataaaaatctaaatattcaataaatgagacctaggagact 3750
actgcagtgacttacaaagtcctaataaaagatgtctctccaaaatggg 3800
gctgcaaaatgtggtgctgccttatcagctctaagtttttccttacctg 3850
agaaagaaggaacctgatgcaggttcaggctcctgccccatgaatgcag 3900
gctgactccaagatgggagctacaggacaatcccaggtcttctaggcc 3950
tcttatttaggccctgggagcctccagagatggccacatcttgaccagcc 4000
cagatagagggaaagatcaccattatctcacctctgtgtcaaatacctag 4050
atgctgtcctccctgagcccacactatagttgccagcgctaatttaatgg 4100
gtagtgtactggttaagagatggacagaccatcctggcttgactctcagc 4150
tctggcaaagatgagtgacttggtttttccatatctcttggccacaccaa 4200
ccttgatttcttcagctgtagaatggaatttctcaagcttgcctcaagga 4250
ttattgcccgaggatttgatgatatggtaagagcttctcagtgtttgacc 4300
catagtaagtgtttgacgtttcaaacgaattgtttctttctaggacatgg 4350
tgagcatttggtagccattcaccggttttctgtttctttggatcatagtt 4400
aacctctcctttttccttctggcactacaatttttctggtgggaagaatcc 4450
ttactttctgcccttccccttaaggataggaagctgatactaggcagcaa 4500
ctagttggggataggaagattgttccagagaaatgctgaaccatagggc 4550
tccagatcacaggaccccagtcttagcttgctgggtgtgggtggggg 4600
gggcggttactgaacatgggtatgaagtagatgtccatttactgaaatgt 4650
gaggacctgaggcctcttctattgctgtagccagcatattccccaacctc 4700
tccccaagaaaggacagatgggggttccccctggagtaacaggtccaaa 4750
agaaaaaacatacagtgggacttccaggatctgggcctgatcacccagca 4800
gtcaagctccccgcaattgactaacaccccccctaacacgtagaaattcca 4850
atctgcaatttagtgaggatgataccttattcttcttaaatacatctct 4900
tcatttcccagagcacccttttttcccctcctctgcaccttttgttaaa 4950
gactggagtataatgaaataccaagagagcataacatgtgatacataaaa 5000
cttttttttctggtttacaaaacagttcattcttgtccatacgtgcttctc 5050
[illegible] 5100
ctgccatacctgctccccagacgcatcgacaagcacacccagagtgttat 5150
ctgctaagacctaaaagagggaggaaccccctctcctcatctaagaccta 5200
gcttctaaattagagtgtgagggtccatctccccaggagggggcacaggc 5250
ccaaacagcccagccatctcagaagacaacactaagctttgtaggggtcc 5300
acagtagaggagagtaagacgcctgttgtttaatttattacagttcctca 5350
aaagtgaagatgtgtgggcgggatggcaagagctgagcagacgaaagctg 5400
aaggaataaggaaagagaggaggacacaaacagctgacacttcctcagtt 5450
cttgtcatttgcctggccctgttctaagcaccttctaggtattaatccat 5500
ttagtcttggctacaacactgtgagtaactagtttttgtcacccccatttt 5550
aaaaatgaagaagtgaggctcagggaggttaagtaacttgcccacagtt 5600

tgtttggaaaggaattgagag[illegible]atataatgaaaagaagcattcacat 5750
gagagtaacagtatcagggcc[illegible]accttcatctaaggtacttcaaagag 5800
gcctaagcaaacttagtcactggcgtggttctagtctccatgatggcaaa 5850
tacattgtgtacagcccaactccacacaaaacttaaataccaatgataga 5900
gcaatctaaaatttgaaagaaaaaatctttcaatttgtcgtcttcccaga 5950
gggacttaatcaagaaaccaatcaaaatacttcctaagcctaactgtgtg 6000
cagaactccaaagagagcccagccctaaatcaacactgtccaatggaaat 6050
ataatataatgtgggcctcatatgcaaggtcatatgtaattttaaatttt 6100
ctagtagccatattaaaaaggtaaaaagaaacaagtgaaattaattttaa 6150
taattttatttagttcaatagatccaaaatgttttctcagcatgtaatca 6200
atataaaaatattaatgaggtatttattattcctttctcaaaccaagtc 6250
tattctataatctggcgtgtattatttacagcacttctcagactatattt 6300
ctttctttctttttttttccgagacaattttgctcttgtcacccaagct 6350
agagtacaatggcgttacctcggctcactgcaacctccgcctcccgggtt 6400
caagttattctcctgcctcagtctcccaagtagctgggactagaggcatg 6450
caccaccacgcctggctaattgtgtatttttagtagagacagggtttcac 6500
catgttggccaggctaatctcaaactcctgagctcaggtgatatgcccac 6550
ctcggcctcccaaagtgttgggattacaggcgtgagccactgcacccggc 6600
ctcagattaactatatttcaagcgttcagtagccacatgtagctagtgct 6650
atggtagtggacagtacagatctgcatttcaattaagacacgtatacaag 6700
catagttcactaatgcacggtaaaaaaagtatagtgctgagtcggtggt 6750
agaaatcctaaatactgcagagcaaaagtggtacgaacagcaatctcagt 6800
gataatgcaaccatgcttgctttcattgcaatttgcttattttccttca 6850
gcaaagttcatccatttttgccaattcaataaatatttactgataaaaac 6900
tttcaatattagattcttgcatcttcatagacagagttgcttttcacatt 6950
tagaaaattacttatcaatgttaaacacacgttttgataaccagtgttgg 7000
aaagaggtgcagactccccatgtgcctattgatggcagaaatattcacag 7050
ccaaaggaaacaaagggctggggacaatcacacacctcatgtctcctaa 7100
ctcctgggaagtgctgtccctctgattgagctcttattattgccttcccc 7150
actaaccctgtccactgtgccctggagcccttgcagggttacctgctct 7200
gtcctcctcacagaatatctcctctacctccttgtccaagctacaacttg 7250
gctattctctgatgacactgtcttccctgtagccctttgagtaatggct 7300
gcatattctcccatagtccagttctttcctgttctccagtctggcttct 7350
ggatgacagcccactagtttgaactccatactgctatagttcaagtccct 7400
tttgacttgttaccttgggcaaattacctcctttgttcaggttccttgt 7450
ttgtaaaatgacgataataatgccatttgcttcagtgggttattttgaaa 7500
ttgagtgaaagaaggcgggtagcttccctacacgctcagtgtagactagc 7550
ctgatgtgcattacgggtgatgccatgactcagtgtgttttcctcatctc 7600
cacatctggctctcatccagtgctcctgcttacggcactctgtccccctc 7650
ttacttactccccttattaactgaagactggcactgatctcacagtttc 7700
ctctccacttcctagtctcaccatcatcctagatgacttcaagtcaccta 7750
gataaactgtctcagtttcttcactcacattttttataacagataatgt 7800
tacactcaagttgtaacagaaccagcttatccagctcatgaaatgtatgc 7850
atttcatctcaactctgtattcagtgacatcctgtgggtatctggaaatc 7900
agccatggtgagaatatttaccatggaaattggcaaatactaaaaagcag 7950
agcaccttttttctgagagccagaccatagctcttctactccatagcac 8000
ccatcataacaattttaaatacctccactgaacagcttcttcctctctc 8050
[illegible] 8100
cttgtaataataacccaaatccctgttccattgttcttcctgctaaaat 8150
actaaacctggtttagtccaaccatattttctctctttggaatctacag 8200
gtggccccaaaacctggaaatggaaaaatattacttattaattttaatgt 8250
atattaataagccattttaatgcttcatttccagtctcagtggccacccct 8300
gtatagctgggctattgagctcttgcgggaggagggagtggacagtctcc 8350
cagccacacagactgatgttgcaccaaacatttttagcttccagacttc 8400
cctggcccttagtgttacccttaactctccatttctctgcctttcacatt 8450
ctctactttttaaaatctctgactccaccttcaccttatcattcttagc 8500
acatgaccatactttctgcttcccaaagaaaatgagcaattacttcctttt 8550
cctttttcctcctgtcatcaaatctgcagacatgtcatgcctaagtccagc 8600

ctttccccaagcctttcccat[illegible]attacctcctcgcacatgcctctgc 8800
agaaaccacccgtttcttccc[illegible]ccctcggcagcctgttcttcctgttc 8850
tgccctcatgatggcaccatcattgtgtcactaaaatcaatctctccgac 8900
atcatcaatggccttcctttgttgggaaacctaataaacactttatctta 8950
tttggtctttgttatgggttgaatgaggttacccgaaatccatattaga 9000
agtcctaacccagtacctcagaatgtgactttatttgggaatagggtc 9050
attgcagacgttattagttaggatgaggtcatactggaatgtgatgggct 9100
gcttatctaatatgactgatgtccttataacaaggagaaatttggagaca 9150
gacacgcacataggagaatacccatgtgatgacaggagttatggagttgg 9200
agtcaaaagctatgggaacttaggagaaagacctggaacaaatcctttc 9250
ctgcgcctagagagggagtatggccctgccactaccttgaattcaacgtt 9300
tcggctttcaaaactgtaagacaatacatttctgttgttcaaaccaatt 9350
agtttgcagtactctgcgactgcagccctaacaaactaatacagtctctt 9400
ggaggcatttggcaaggttgacaatggaagcactttcttacccttagg 9450
tctgtcgcctttcttgttgggggtgttttctaacaattcctctccatct 9500
ctctctctctagtttgtcttaaacattggtgttcttcagacttctgacct 9550
aggccttcttttcacttcacatattcccctgggtggtctcacccacttcc 9600
agaaattacttaaattactgctcatgcagtactgtgctggaaactgttta 9650
acaactggctctctgggaagagggagactggttgatggttttgctgat 9700
ttctgtggtgtaaatactccctccatggccaattccaaactgccaacagt 9750
ttaacaactggctcacaaattttctccaaatttaacatttggctttcaca 9800
ggccaacaacgtggtacagccaactccagcacactctgctttgtgtca 9850
gagagaagtaacttattttgtacaaaggtaaaataaaacacctgcag 9900
gcccccttttttccttaacaaactgctctagaaatagaatagctgaagc 9950
ttcttttatgcattcatctgttatttccatgtcactgtggtggtgggatt 10000
atttttcctttatttttcttgtatatggttgaaatactgtacctttgatc 10050
agttttagttttatggcatgtttgcacccatattaaatctagttttgt 10100
cagagggcgtcaatattatttctcaaaacaagaaaatatttcattgcaa 10150
aggagacaaacaaaaggtccttaatacaaaactttgaaatgtgatttc 10200
ttgtacttggcagtgtccaagtggtaaacccaaacagtattgggttttca 10250
ttttgttcaggaaagtctttgtctggcagcgacttaccctacatcaggc 10300
gggccttgctcattcattcacttaagtatttattaaacaccagcggtgtg 10350
ccaagtacttatctaggtatcgggtagattctgataagtcagtcaggtcc 10400
ctgctctcagggagcttgcagcagagatgggggctgcaatagagagtaag 10450
ccaaggaaatgaaaaaggaagttgatttcagagagtgatgaatgctatga 10500
agaaaatgaaggcagcgcagtgtgatggagagtgacccaaggtggtacag 10550
tttgtacctctaaggaccagactgtgacccaggtcactcacagatgcccg 10600
tcatgtgatgccacagcaactttccaggtgctcgtttcctcccacttcc 10650
cagtctcttgcccagccgcgactgcttacaaatacagctagaggaatcta 10700
aatgaggttcctctatcatcaaacccaatcaaaatgccaaggaacagaat 10750
cagtgcctggctgaaggcagtggaacagggccagcctggagtggttctct 10800
ctgaggaagttcctcatcttggttttagggccatacctttgtgacctgtga 10850
gctaggggttgccagtccctgacatttctactgaggactcgcctgtctat 10900
attcccggcctgtatgtgtctcctgagttccagacacacagggcgaagcg 10950
cctgatggatggaagtatgtttttggtgttccattggtatctcaaattc 11000
tacaaaacttagtgccccttctcctccctgttcctccccatcttcagtct 11050
atcacctgttcctcatccagcaaatgatattaccatcttccaaggagctt 11100
[illegible] 11150
taggccaggtacaatagctcacgcctataatcccagcactttgggaggct 11200
gaggcaggtggatcatttgaggccaggagttcaagaccagcctggccaac 11250
aaggtgaaacctgtctcatttaaaaaaagttattttaaaaactcaaatct 11300
attatttctacctctaagtgtgtcttgaatttatccatctctctccatct 11350
ctgagctgttaccttacctcagtccatcacgttttgtctacgttaacatg 11400
accagagtcttgttcttagtctggtgaggtcactccagctgcttcagatc 11450
cttccatggctcaccgttgccctcatataaagttggcactcctggacatg 11500
tggcttacggggcccccgtgatgtggccctatttgcttctccattctgt 11550
tctctcccagcctctctgcccccatctctaggcaccaaccacacccttct 11600
gctcgtcaatggtgccagcttctcttctatctctggtctttggacagact 11650

aggagtccctctgaatgtttccatagcattttaaagaattgcctattta 11850
cttgttcgtatctatcactaa[illegible]acaaattgtatgagaacagccactat 11900
ctctgcctggttcaccattca[illegible]ccagcaactagcataatgcctggcag 11950
agtcagcctgcaacaaatatttgttgaataaattaacagatggctttatc 12000
tccttaagtaaatcttgctttttcacctattaaaacagacgcacaggcc 12050
aggtgtggtggcccatgcctgtaatcccagcactttggcaggctgaggtg 12100
ggcggatcacctgaggtcaggagttcaagaccagcctggccaacatggtg 12150
aaaccccatctctaataaaaatacaaaaattagctgggcatggtggtggg 12200
tgcgtatagtcccagctactagggaggctgaggcaagagaatcgcttgaa 12250
cccaggaggcagaggtggcagtgagccgagatcatgccactgtactccag 12300
cctggatgacagagaccctgtctcaaacacacacacacacacacacaca 12350
cacacacacacacacacacacacacaccaagttgtataatttaaata 12400
taacgtgcttgttatggaacacttgtaaaatacaggaaagtaatgaaaaa 12450
gtctaccatctagctcaccacataatgaccattgctatcatcctggcata 12500
attctctcctgtatataaatatatattctttattgttaaaattacacta 12550
tgagtactatttatttatttactgtggcaaaatgcgcaaaacataaaat 12600
cttgccattttaaggtatgcagtttggtgcattcaccacactcacattgt 12650
tgtgcaaatatcaccactatctatctcagaacttcttcgtcttcccaaac 12700
tgaaactctgtacccattaaacaatagtgcatcctctgtttttcccctccc 12750
tacaatttatttttatttgggtttgtaccaaactgaaaatagctgcttct 12800
tccttacttagttcagattagcatttccatttatttagccgtggttttga 12850
ggatgccatgacagatgccatccttcctagagctctttgggctgtcagg 12900
tatttcagtcagggtgaattcgggttgataacattttaaaatctcacttt 12950
attctgaggttcctagtgtcagagcccaccgtatttttagggactcccaa 13000
gttacaaacaaaaatatggtgaggaggaatcactgaagttttaacacaag 13050
agacttacattttgttcaatttctatctttagtttatttcctaagcata 13100
aagaaatactttgaaaatttacatagcattatacatatttaattaagca 13150
tgagcacatcttaaactttaaatttagatcagatctttaattcctagg 13200
atattaagaggtactggcaatttggccaggtgtggtggttcacgcctata 13250
atcccaacactttgggaggtgaagtgggcgaattgctagagcccaggag 13300
gtggaggctgcaatggcctgagatcacgccatcgtactccagcctggatg 13350
atgagaatgaaatcctgtctcaaaaaaaaaaaaaaaaaaaaagaagaa 13400
gaagaagtattggcaatcagtgctccaggaataatttcctgacttgaaat 13450
aaacctacatgtagacaaactaattaggccattccaagagttgctagcat 13500
tggtttaatatgttttcagagcattccaggaagcagtgtggccagcattg 13550
catgtttgatacttcagaaatgtatgacaggtgtttctcttacccaggtc 13600
ttctgttttcttagttttgctcatgtaaatatttatgaacatcctcatct 13650
ttttgagggaagggattatagatcattctaattccattttctagcatttg 13700
gtaccattctaagcacatgataggcacccatttggagcatttttggcttg 13750
acagaatatgcatttagaattgttcaaattagaggtgtcagtgatgggaa 13800
ttagaatactatataattctaagtcatttgacttaaatacaaaagaatga 13850
ttttccttggtggggaatggtgaagggaggcaggagttaagaagaggaga 13900
agagatcctaagtcatttataaacttctctggaaagacaggtgtgtgaag 13950
actttttaaaagtcattcaccaaattgtgtgtgtgtgtgtgtgtgtgtt 14000
ttaaatagactttatttttagagcagttttaggttcacagcaaaattga 14050
atgcaaggacagagatttcccataaacccccctgcccacacacatgcatag 14100
cctccctcattatcaacatccccaccagagaggtgtttgttctagttgat 14150
gaacctacactgacacatcattatcacccaaagtccatagttcacggcag 14200
[illegible]ggtgcacattcctatgggttggagcaaatgtataatgaca 14250
tgtatccaccattatagtaacatacagagtattttcagtgccctgcaaat 14300
cccctgttctccacctattcatccctccctctctgcatttccaccccccag 14350
cccctggtaaccgctgatctttttactgtcccatagtttcggacgatcta 14400
tttttcagacagacacagagctgtctttcccttagtttctattctatcat 14450
ttctttctccccatccatcataaaaggctatgagtttttttaagtgttg 14500
aacaccatcctacttgtcaagttaaaacataagctcctggctggtacag 14550
tggctcatgcctgtaatctcagcatttgggaggctgtggcagaagcatc 14600
acttgaagccagaagtttgagaccagcctgggcaacatagcaagacccca 14650
tccctccacacacaaacacacacacacacacacacacacacacacacaca 14700
cacacacacacacaaaaacaagctcttgccagaattagagct[illegible] 14750

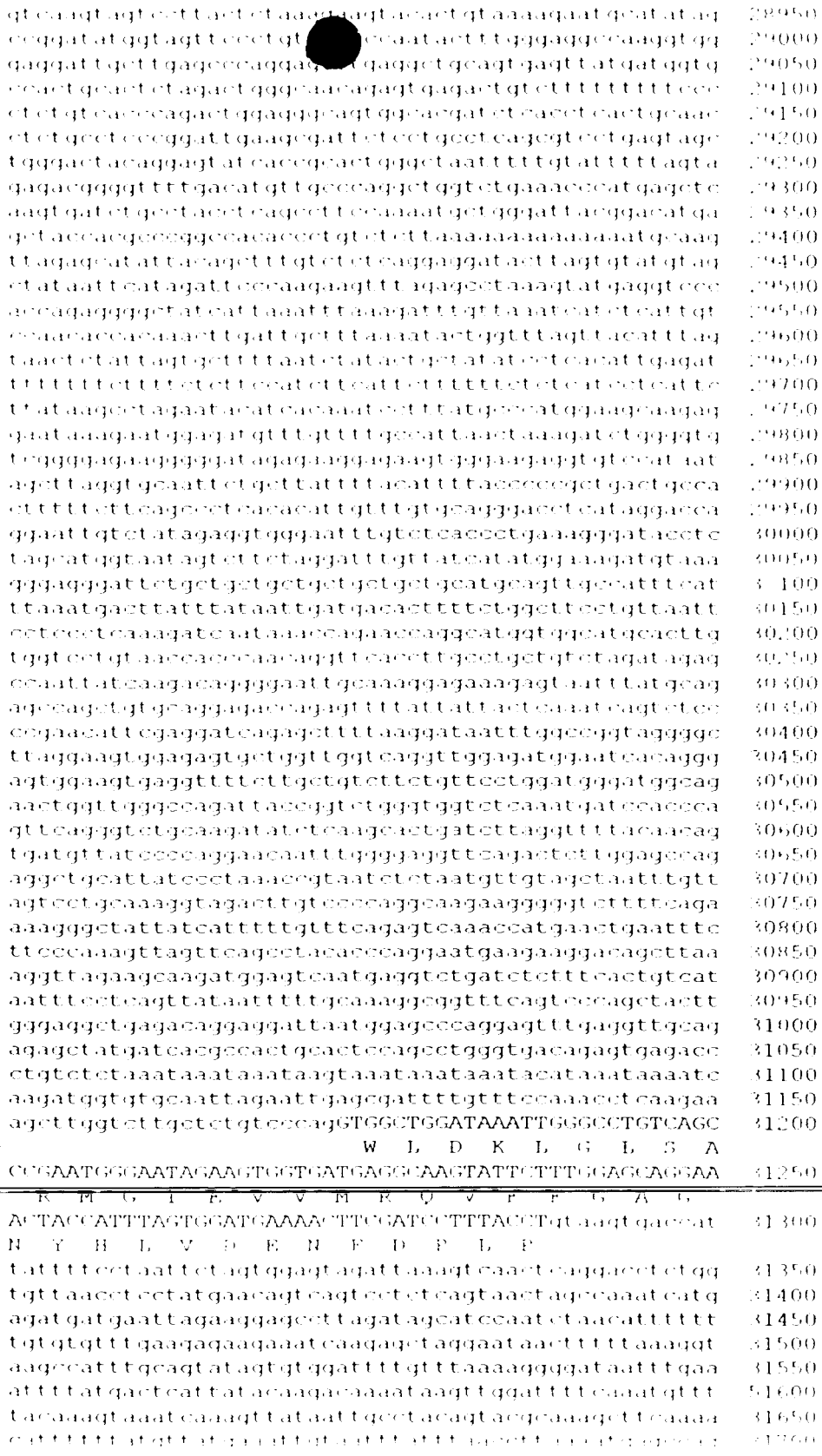
aaataaaattaaacaatactgcctgtaatctcagctacccaggaggcag 14900
aagcagaactgcttcaacccg[illegible]gcagaagttgcagtgaagtgagatc 14950
gcgccactgcactccagcctgg[illegible]aacagagcaagattctgtctcaaaaa 15000
caaaacaatgtgatttcctcctctaagtcctgcacagggaaatgttaaga 15050
aataggtccaccaggaaagaaggaagtaagaatgtttgactagattgtct 15100
tggaaaaaatagttatactttcttgcttgtcttcctaacagTTCTCCAAA 15150
S P K
GCTTCGTACCTTGGCCAGAGGCTTGTCTCCTGCGTACCTGAGGTTTGGTG 15200
L R T L A R G L S P A Y L R F G
GCACCAAGACAGACTTCCTAATTTTCGATCCCAAGAAGGAATCAACCTTT 15250
G T K T D F L I F D P K K E S T F
GAAGAGAGAAGTTACTGGCAATCTCAAGTCAACCAGGgtgaaaattttta 15300
E E R S Y W Q S Q V N Q
aagattcactctatattttaattaacgtcagtccgtcatgagaatgcttt 15350
gagaaaactgttatttctcacacctaacaattaatgagattaacttcctc 15400
tcccctcatctgacctgtggaggaatctgaacaagaggaggaggcagtgg 15450
gcaggtttccttatcatgatgtttgtcatgttcagtgtgaggcctcacaa 15500
aaaaaaaaaaaaaaaaaaggcgtcctggatataactgagagctcattg 15550
tacagtaaatattaataaaacagtgattgtagctgaaggatagaactgct 15600
tggagggagcaagtgggtagaatcgcgtcaaactaaagagcatttctagc 15650
caaagacacaatgatagattgaaggatatttattctaaatatagaatatg 15700
ggtgaacgagatctgtggacttctgggctccaacgttagattctgatttt 15750
agcaagcttgtcagggattctgatattgaaaggctgtggccttcacctg 15800
agaaacctgccctaggggccatgaaaatttgtcctgtctttcagaagtg 15850
ctatcagacatcaaatggaagttaaatcgtatcttaacaattactaggat 15900
gggcgcagtgactcacacctgtaatcccaacactttgggaggctgaggca 15950
ggaggatcacttgagcccaggagttcgggaccagcctgggcaacatagag 16000
agacgttgtctctatttttaataatttaaagagaaaaaatactgaaaa 16050
tattgtatacaccactgaattataataatgtgtatataatgtatatattc 16100
attatgaggaatatttgattatttcatatattatatctttttccttctgtt 16150
tattttatccagttatgaagtatttagaacaattcatcagtaattggggc 16200
taaattgacagaatagtaatcagagaaaatagaaaaagacagatgggtta 16250
tctttgaataccaggttggagttgtttatgggtttgtttttgtttggg 16300
ggcgtttttttagacagagtcccactctgttgcccaggctggagtgcagt 16350
ggcacaagcatggcccactgcatccttgacctcttgggctcaagcaatct 16400
tcccaccttagcctcctgagtagctgggaccacaggtgcatgtcaccaca 16450
cccagctaatttttttatttttttgtagagacagtctttctatgttatcca 16500
ggctgatctcaaactcctgcactcaagtgatccccctgccttggcgtccc 16550
aaagtattgggattataggcatagccaccacacccaacctagtttctatt 16600
tagacttggccctttcccaccagtcatttgtgtccaaaagatctcataaa 16650
tgtagacaggaaactgtcctttgctcatcagtttttcttcatcctgtgtct 16700
aggggatggtcggtggggaaactggggttatgcaagttcctctgaaac 16750
atcctctgtgagcccagggatggatgaggcaccagccgccagcgagtcag 16800
tgtgcagctttccagaaaggaagtcatcagccagtcagccggccctggca 16850
gccagcacccggcaaccctgctgtcttgtgataaagaaatggtctgcctg 16900
acaggatggtgtggatttttctttttcttttttttttttgagacagg 16950
gtctggctctgtcgcccaggctggagtgcaatggcgggatcttggctcac 17000
tgcagcctctgcctcccaggctcaaggcatcctcccacctcggtctcccg 17050
agtagctgggaccacaggcacacaccaccacgcccaactaagttttcgta 17100
tttttagtagaggcagggtttttactatgttgtccaggctagtctcaaact 17150
cctgagctcaagctatccatctgccttggcctcccaaagagctggaatta 17200
caagcgtgagccactgtgcctgaccagggtggatttttttcaagtgcacat 17250
gttgtggtcccagaagctctgatggtaccaaattccaagcgaaaaaaagt 17300
caatggttcccacccatcctacctcccatgatggcaagaggaaatcacca 17350
cactgcagatacagtccatgtaaaacaaattgctatggattttgaaagtg 17400
aaccttaagagaactgcactatgttttcttcattagagttctctggtaat 17450
ttccagcttttttttttttttttttagacagtgtctcgctttgtcgccc 17500
agtgtcacccaggctggagtgcagtgacgtgatctcggctcactgcaacc 17550
[illegible]

acaggtgtgagccactgcacc[illegible]ccagtaatttcaagcttctgaggagc 17750
cctttgaattgttaaataact[illegible]agctatgtccaacatatccatgttca 17800
gtgtatgttcgatatttcttaggaaacctgcccttggttgttttctttgt 17850
ggtaattcatgagccggcaaatttgacatgtgttacagaatatacctttt 17900
ctctgctctcctacctcataaccagaacttaattatcctgctttagtcac 17950
ataaatagctaactaaataaatatatgagatttcagtctgctcactgtga 18000
aaatagaccttctaaatgatctcttccacttgcagATATTTGCAAATATG 18050
D I C K Y
GATCCATCCCTCCTGATGTGGAGGAGAAGTTACGGTTGGAATGGCCCTAC 18100
G S I P P D V E E K L R L E W P Y
CAGGAGCAATTGCTACTCCGAGAACACTACCAGAAAAAGTTCAAGAACAG 18150
Q E Q L L L R E H Y Q K K F K N S
CACCTACTCAAgtaagaaatgaaaggcaccctagagatgttccagcccca 18200
T Y S
aagatatttgaataggttggactcgggcaccaatctagcaagtcctacgg 18250
aagttgtataaagctgaaaatactgaagcatttcccaaatggaaatcct 18300
aaactcaaaacttgcttttggtttttttgtttgtttgtttttttcttcat 18350
ctgacattgcttagtagtcacagaatgaaagataaatcaatcattcatga 18400
tctaacaatgaccttcagtgctctaaaaactacggagtcaaggaaaaca 18450
tgaatatattcctcatgtaaaattaaaatacagacatataaagggcaaaa 18500
catgaacatcattcataccttgaggtccgtcccccctcccagaaataaccc 18550
ccagtatgccttggtttagagcattaagcaggaggccctgagtcactcc 18600
agacagtcttgacccaccaagcagcattctctttttgtttcctctgtggct 18650
tttgcaaacacagggctagctcagctacccattagtatgttttcagtcac 18700
taaaacagtcttccagtcttcaaattaggatgacattgtcacatggggct 18750
ttaaagcaagtgaaacaaggaaccccctttttttttttttttgagatgga 18800
atctcactcttgtcgcccagcctggagtgcaatggcgcaatcttggctca 18850
ctgcaacctccacctcccaggttcaagagattctcctgccttagcctcct 18900
attcattatgaggaatatttgattattcagttcctgtagggtaaagatat 18950
taccccgatcatattattgattattgagtagctgagattacaggtgcct 19000
gccaccacgacccggctaatttttgtatttttagtagagacagggtttc 19050
accatgttggccaggctccaggctcgtctcgaactcctgacctcaggtga 19100
tccacccacctcagcctcccaaagttctgggattacaggcgtgagccacc 19150
actcctggccacaatcctttttaactatgaaatatatttttatctgaag 19200
tttgatgtttatacccaactgagggatgatgttcccatatctcagttaaa 19250
gaaataacctgctcagatacttcaagctcttcttttgacttttgaaaata 19300
aatgatcttgaagttactatactttgtttgggttagttaacattatttaa 19350
agtatattattttaattaattatctttgtaagatttactgtatactacc 19400
tggagttcaatgtatcagatggatttcaaatttatgtacatttttatgt 19450
atatggtacagaaaaaaatgtgatccataagaaatcagaaaatagcgcat 19500
atgctaatagctaatgttgtcctctaaaaacttatttttgcatttttaa 19550
gaggggatatactctgacactttaataagtgtaattaattattgactgg 19600
aatttggcatgaggcagggccatttcagatcccattaaaggaatgacaca 19650
taccagagaaccacagaagtaaggccacatttgtaataaatcattatagc 19700
tctgctaggagaagacccagttgtattaggtaattaatggatttgctctt 19750
aaaacacatgtcccggaagatataggtgagtcttgggggccgcattaaa 19800
cattataccaatgtatcttacatttctaagaaagtttttactactttacag 19850
[illegible] 19900
catagttcctacaccaggggaaatgccttcctttgctaactatgcaacca 19950
ggttagttagtgtaagtccagccaccctgttggcaatgctaaaaggtaca 20000
acaaacacagaatttttatttgcatttgtaaacatttgatttctggctcga 20050
aattttcagttttcatgggcacgtcatggaaacagaaatcttctgtgttt 20100
agtttgggcacctactcattgtagtgacaaatatttcagaagccaatagg 20150
ggattccacaaattgttctgaacctgtggctgagactggtaatggctgag 20200
tgacatggggacataccacaaagaagaggtagcaaaaggctgctgagat 20250
aaggacatgttcattgcttagctagtggcctgcacccttaaaacacatgt 20300
cccaggctgggtgctgtggctcacgcctgtaatcccagcactttgggagg 20350
ctgaggcgggtggattacctgaggtcaggagttcgagaccaacctggcca 20400

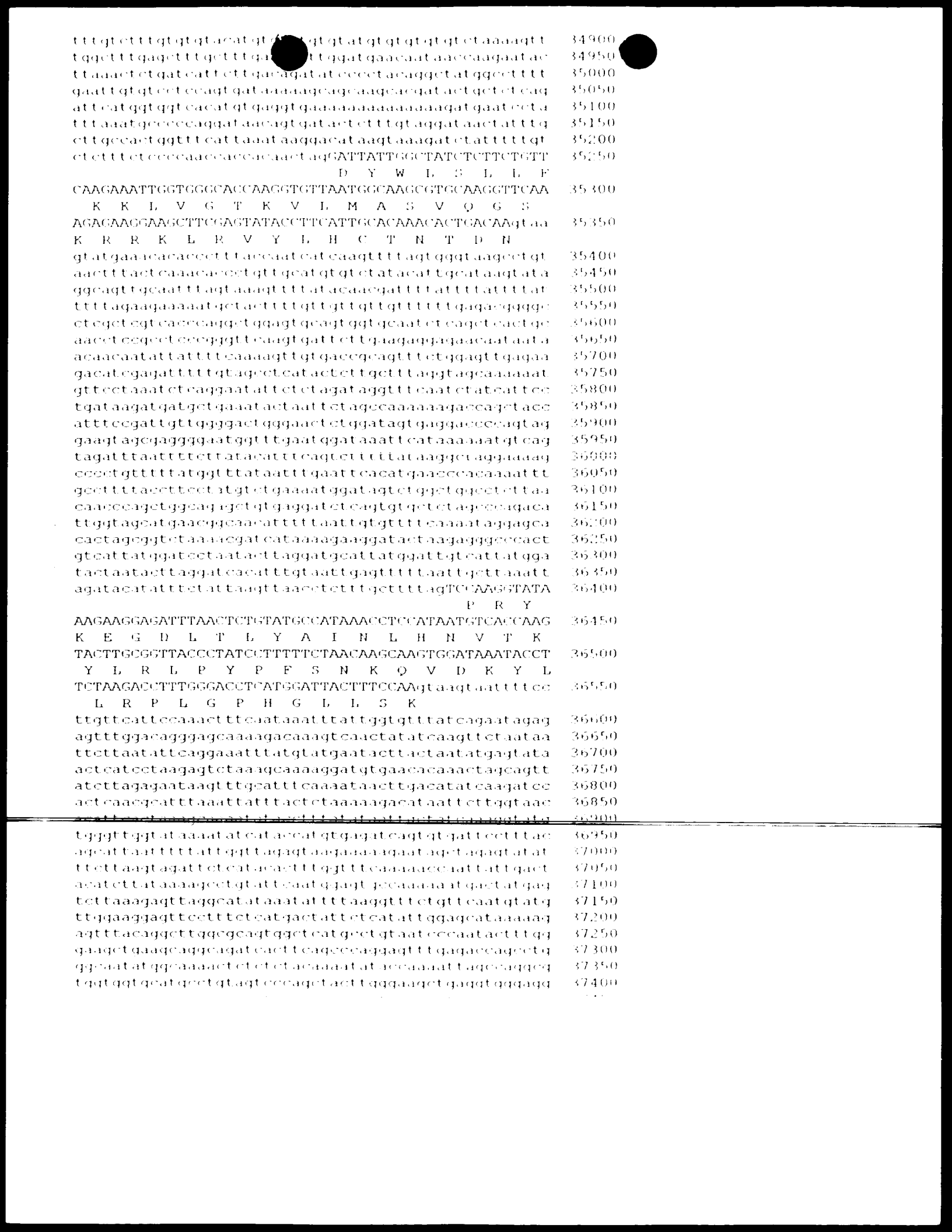
cgctagcctgggcgacaaagt[illegible]actctgtctcaaaaaaacaaaaacaa 20600
aaaacaaacaaacaaaaaac[illegible]acaacaaaaaaacgggtatcccagaa 20650
gatacaggtaagttttctaacacaggtcctcttgtatggtgcgttccact 20700
taagtagaagatgacaaaacatttgtcatgagaatatagactcacattt 20750
taaacctgtttgagcaggaaaaggaagcaatgttacagatgtaattctgg 20800
gtgtgactgcagaaaggatgactcccttattaaagtagtcatcctgagtg 20850
agctaactctttgtacttcctcttctcctcctgttcccctcatcacccca 20900
ttcttccgttgcctacatccaggcccacattggatgctgacatagactta 20950
catggtacagtccaaggaaagatctgccatttttttcaatgtgtcatct 21000
tggttatcttcattccaaggatctctccactctttatacagtaagagatg 21050
agagtctggaaaggattggaataagataatgaattgtaagttttaaatt 21100
gttcttcgtatttgggaaggagtaggctaggtggtccttctgtttttt 21150
ttttgtttttttttttaaagtagatgtggccagacgtggtggctcacgcc 21200
tgtaatcccagcactttgaggaggctgaggcaggtggatcacttgatgtca 21250
ggagttcaagaccagcctggccaacacagtgaaaccccgtctttactaaa 21300
aatacaaaaactagccgggcttggtggcgtgcacctgtagtcccagctac 21350
tgcagaggtggaggcaggagaatcacttgaacccgggaggtggaggttgc 21400
agtgagccaagatcatgccattgtactccagcctgggcgacagaacaata 21450
ctctgtctcaaaaaaagagaaagaaagaaaaaaagaatggatttga 21500
actcagtcgtcaatagcctctattccaggagatgttacagttgattatgt 21550
tataggggtgtataatagaatttcgagctatgtaaattccaagtgcatt 21600
tggaagaatgaagaaatggaggaagggtaaagtatgagtgcaagcattcc 21650
aggtttttgaaatgctataatctttgttcagggctagtacaaagtgct 21700
atttagctgtaagggtttttgtgatttacagacagttttcacatgtgtc 21750
atttcaaccttggtttatggcgaaggcatgtgatggtgcttgtcccagg 21800
actttagatccatatctgaggttcctgtcgggcaaagatattacccctga 21850
tcatattatagtctataagtggagagttgtgcctggagctcaagtctta 21900
tgatttctgatccagggcacttcctacaacatgattttgcaatataaaag 21950
cctataatgtgtgactaaagcaggtcactcaccccttgtaacagactcta 22000
gtaatggtactgccaccaacggctgcgtgatattgggcaaagacttacc 22050
ttatttgaatctcagtttcctcctagaaaaatgaggtggaggttaagca 22100
taggctgatgatcctaaagcctccatactgccctaaactgtggctctaag 22150
atccagtagaatgctgggtcacaggactctagggagctttcaaacccaa 22200
atgtctgtcattccttgatggtaggcagcagtttatggaagtgggcgaca 22250
cagcaaatatcaaaatacctaaagcagcttgcaagagttgtttctgccta 22300
gtggtctttatagttaatattaaatagttaatttttttttttttgagac 22350
agagtcttgctctgttacccaggctgcagtgcagtggcacaatctcggct 22400
cactgcaacctccacctcccgggtttgagcaattctgtctcagcctccca 22450
agtagctgggactacaggtgcatgccactgcacccagctaattttgtat 22500
ttttagtagagacggggtttcaccatattggccaggctggtctcgaactc 22550
ttgacctcaggtgatccacctgcctcagcctcccaaagtgctgggattac 22600
aggcatgagccactgcacccagcttaaatagctaatatttaatattattc 22650
tatagttattcaagtaattcaggccaaagacttagaaacaaaacaaaag 22700
ccactttaaggagaaagggtgtaagtttgccagatagatagagatcttt 22750
ctttttaactacaagagttcaggaatgaattactctttaacaaacgact 22800
atagatatacatgaaaattggaaggacttattatgcatatgataatcaat 22850
ttaaagacaacacttaaaattatattgttgccactctcaaaaagtggtaa 22900
[illegible]
ggcaccttaatatcgcagaaaacttttaaagcatgcctaggccacaaaa 23000
aatacctgtattttgattattaaattgtaaggtctacacaacctaatagt 23050
aataggtccaatagtaatgctgtccaatagatgttgatgtttttttcctt 23100
gcaaacttaaaagatcctacagtgcctctgtaaatagcactgcctggtta 23150
gagttgaatttcagataaataatttttttcatgttaattatttttctttt 23200
ctttactttttttttttgtttttttgtttttttgtttttttttttgagaca 23250
gggtctcattctgttgcccaggctgctgtgcaatggcatgatcatggctc 23300
actgcagccttgacctccctgggctcaggtgatcctcccacctcagcctc 23350
ccaagtagctagctgggactacaggtgcttaccatcatgcccggctaatt 23400
tttgtgtttttttgtagagatgtggtttttgccatgttgcccaggctggtct 23450

tcaagtttaactaggtgccctgcactttagttgctaaatcctgtagctg 23650
taccca tgcattcactggtgc[illegible]cagcttgccttgcacagagtttgga 23700
aaccatagtcctataactctag[illegible]caatttttaatgtaaaatttgattc 23750
attttaaattaataaataataacaggaatttttttaaaaattgttttaaa 23800
tataattaaaattatcaaaatatttttaactgaacttgtgactagagat 23850
atttagattatgaagagtggggttatgctaactaatgacagtctggcta 23900
tgcatgtggagcactgagctataaattgtggcttccccaattctcctgat 23950
gtcacttgaacaaaacctaagtgtcagaccagagcttctggtatcttcca 24000
tgggatttcattcaacagctggagcaaatgaagtcagattgattttttt 24050
aatttgtccaattttgttgtctcaaaaacataattataatcatttattag 24100
aactagaatttcttcagtttaacaacagaaatagttattcattatgaaaa 24150
gcgaatctggaggccttcattgtggtgccaatctaaccattaaattgtga 24200
cgtttttcttttagCAAGCTCTGTAGATGTGCTATACACTTTTGCAAACT 24250
K S S V D V L Y T F A N
GCTCAGGACTGGACTTGATCTTTGGCCTAAATGCGTTATTAAGAACAGCA 24300
C S G L D L I F G L N A L L R T A
GATTTGCAGTGGAACAGTTCTAATGCTCAGTTGCTCCTGGACTACTGCTC 24350
D L Q W N S S N A Q L L L D Y C S
TTCCAAGGGGTATAACATTTCTTGGGAACTAGGCAATGgtgagtacccca 24400
S K G Y N I S W E L G N
gggaacaattcattaataaggagattccccactagcattatttcttttct 24450
tttctttttctttttcttttttttttttttgagacagagtctcgcactgc 24500
tgcccaggctggagtgcagtggcgccacctcggctcacttgaagctctgc 24550
ctcccaaacgccattctcctgcctcagcctcccgagtagctgggactac 24600
aggcacccgccaccgcgcccggctaattttttttttttttttttttttt 24650
ttttttgcatttttagtagagacggggtttcaccgtgttagccaggatg 24700
gtcttgatctcctgacctcgtgatctgccctcctcggcctcccaaagtgc 24750
tgggattacaggcgtgagccaccaggcccggctagcattatttcttatga 24800
cactttttttttttttgagacggagtctcgctctgtcgcccaggctgg 24850
agtgcagtggcgccatctcggctcactgcaagctccacctcccaggttca 24900
cgccattctcctgcctcagcctcccgagtagctgggactacacgcacccg 24950
ccaccacgcccggctaatttttttgtatttttagtagagacggggtttca 25000
ccgtgttagccaggatggtctctatatcctgaccccatgatctgcccgcc 25050
tcggcctcccaaagtggtgggattacaggcgtgagccactgcgcccggcc 25100
aacactctttttattattagcaaatatacttctgcctgggcacattcttg 25150
caagtgctcaacaatgcaactttggaagtgcatgtggcagaaactcctg 25200
ctgtatttattccagaacctattattgctaatcccagtttatgttacatt 25250
tgaagtgagaaccagttggagccagcaacgttcccagctccaaagttccc 25300
ttgagattttcagaatcacttaaccctattatgcttggcaacctggactc 25350
agcaaaactgggaagtcagcagtttgttttattcatcccttcctttctca 25400
gtttctcaaatgtgtcagttaatctcagtaaccccattgcaaccttcatt 25450
acctgcccaagcggtctagaacttgccagtatagaatcctacgtgggtca 25500
agctcctgactgtctccttcttcactctttttttgcaaagaacttgtaaa 25550
ttttaactataagtattcatgattcgccacatttattcaaaacatagagt 25600
gctttttccacatatcagccaatggaaataaggattaaatgggaaatgaa 25650
atgtagtaataggataagcacaagtcttcttcctgctcaaacttttttt 25700
ttttttttttcagacaagatcttgctctgttacccaggctggagtgcagt 25750
ggcgtgttcatagctcaatgtaacctccaactcctgggctcatgcaatct 25800
cccacacttagcccctgattagctaggactacactatgcctagccaat 25850
tttttttcttttgtctggttgtgttgcccaggctgtctcgatctcctggc 25900
ctcaagtaatcctcctgcctcggcctctaaagtgctgggattataggca 25950
tgagccactgtgcccggtctcaaccttttttcaaagtaaatgaagtt 26000
attagatatggaatatagtctagttcccagatatccatatccattggttt 26050
attaccctcattattaacttcaaattgtttaatagaccctcatatctcag 26100
ttatacagttaaaattttgttttgtttttctggagtatcttatttataa 26150
ctatgagttttactttacttatttatttattttttgagacagacgcttg 26200
ctctgtcactcaggctggagtgcggttgcgtgatcatggctcactatggc 26250
ctcgaccttctgggctcaagtgatcctctccctcagcctcccaagctgag 26300
[illegible] 26350

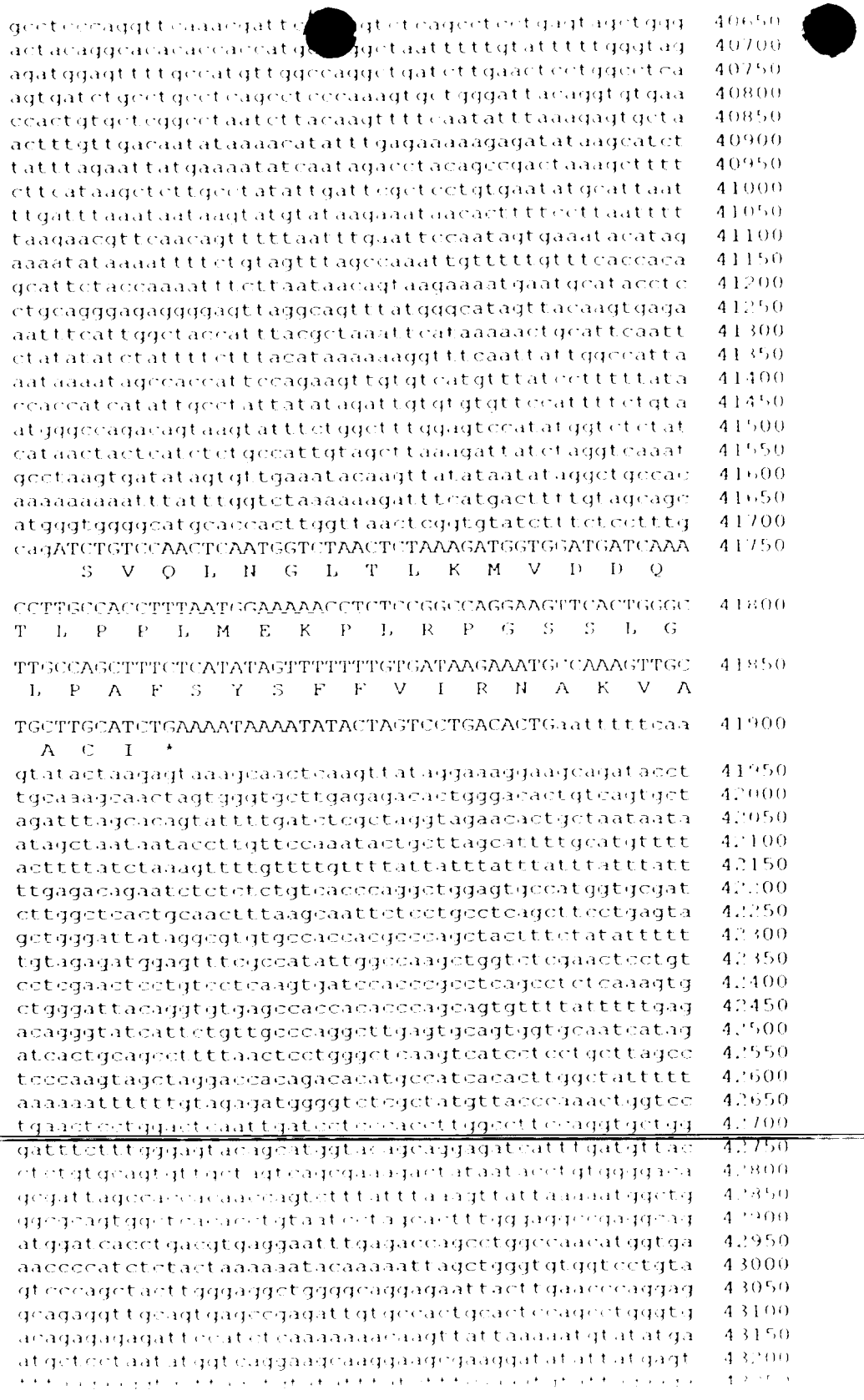
```
catagcgccagacctgqtttt[redacted]ttcttgactttqaattacaagtttt  26500
tgtaatttggaaaatgttttg[redacted]ttttaaatactgctgtatgtttgct  26550
tttaaatacaacatttctcgatatatattttgagaattgctgtctttcag  26600
AACCTAACAGTTTCCTTAAGAAGGCTGATATTTTCATCAATGGGTCGCAG  26650
E  P  N  S  F  L  K  K  A  D  I  F  I  N  G  S  Q
TTAGGAGAAGATTTTATTCAATTGCATAAACTTCTAAGAAAGTCCACCTT  26700
 L  G  E  D  F  I  Q  L  H  K  L  L  R  K  S  T  F
CAAAAATGCAAAACTCTATGGTCCTGATGTTGGTCAGCCTCGAAGAAAGA  26750
   K  N  A  K  L  Y  G  P  D  V  G  Q  P  R  R  K
CGGCTAAGATGCTGAAGAGgtaqqaactagaqgatgcagaatcactttac  26800
T  A  K  M  L  K  S
ttttcttctttttcctttgagacagagtctcactctgtcagccagactg  26850
gagtgcagtggtacaatcatggctcactgcaacttccacctcccaggctc  26900
aagcaatcctcccatctcagtcccacaaatagctgggactacaggtgcac  26950
atcaccacacctggctactttaaaaaaatttttttgtagagatgggtct  27000
ccctgttgttgcccaggctggtctcttgaattcctgtgctcaagccatcct  27050
tccacctcagcctcccaagtgctgggattacaggcatgagccaccacac  27100
ccagccaccactttttcttaaaaaaaaaaaagattctctctgggtagacaa  27150
tcctcaatagtccacatgttattaaacaatctgctgcctgaatacatgat  27200
ttaccaaaaaaaaggaaattttgacgggttcagaatatcaagggatctgag  27250
gcaaatgtcacctatgataaaatttgctatcaaaattaggaagtttgtgt  27300
ttacctgatcctaaagcagtaacccagcccatttctagggaataaaactct  27350
catgcgtatattgtgcatatatatgtattatatgactgagtgataataaa  27400
atttttttctagCTTCCTGAAGGCTGGTGGAGAAGTGATTGATTCAGTT  27450
                F  L  K  A  G  G  E  V  I  D  S  V
ACATGGCATCAgtaagtatgtctcctattcttaatactaggaaagtaagg  27500
T  W  H  H
ctagctttatttattacctagtattcaaaaagttagttcatttaactgcc  27550
aattgactgcagttcaaataagaaacaaatagtgtctcaagtagcactgt  27600
actccaatttttaatattaataaaaaaaatttttaagttattttaaataatg  27650
tagtggtttctataaagatcactttatacagaagaacagtgccaatttaac  27700
ccatggaacatataagtagctaaaaccaattgcttgccaaagaaccagta  27750
acccaggagtacatgtccttgccactgtgttttttcaagacagagtaact  27800
gatttctagttacttgcatagaatggactcctcctcataactcccttcca  27850
tcttggtctttccctagtagaaacttctacctttttttagtaacaggtgag  27900
tgggagaggtaagaaggagaataaggtcagcaattaacctaaaagcagaa  27950
agtaaaatttgttatttttttttctgaatattttctgtgtaatttagCTAC  28000
                                                    Y
TATTTGAATGGACGGACTGCTACCAGGGAAGATTTTCTAAACCCTGATGT  28050
 Y  L  N  G  R  T  A  T  R  E  D  F  I  N  P  D  V
ATTGGACATTTTTATTTCATCTGTGCAAAAAGTTTTCCAGgtaatagtct  28100
   L  D  I  F  I  S  S  V  Q  K  V  F  Q
ttttaaacttttaatgtaaaaccagaatccttatttttatagtctagcta  28150
gttctaaattctataggtatgtatatttacatgtttttctaattttagag  28200
aacaagcactatgacttatccactgttagttttccccttagcattgggtc  28250
ttaccccatgtacgtgattagaaatttgaaatatttccaatagcctttag  28300
tagaattaactcacatagatgataagaatgggttggttcacttcatgttc  28350
[redacted]                                          28400
actatgaacatattttataactatataggaggggtgggtctaggaatacа  28450
aagttttgaatgttgttaatcttcaacaccacagttgaaaccacaggtca  28500
gcttttttgcaattaccatggatactttctgttctatagGTGGTTGAGA  28550
                                    V  V  E
GCACCAGGCCTGGCAAGAAGGTCTGGTTAGGAGAAACAAGCTCTGCATAT  28600
S  T  R  P  G  K  K  V  W  L  G  E  T  S  S  A  Y
GGAGGCGGAGCGCCCTTGCTATCCGACACCTTTGCAGCTGGCTTTATgtg  28650
 G  G  G  A  P  L  L  S  D  T  F  A  A  G  F  M
agtgaagcagcgctggccttagggtcagagtgcaagctcttctccatcct  28700
tctattctgctgaaataqctccccagccaaaaaqcagatcaaagaccgtt  28750
```



```
aactgtatctgtgtgctaaatc[redacted]aatgtttcttccccaaaaagcctcgt  31850
ggaagatctgtatgtctaaat[redacted]gtcaggggataataagatgtagccc  31900
tgcgaagcatgaccttgatttttataqtctaaaatgtcatttgcagatat  31950
ctatttttctaagaataattcctaaaagaattatttgaatgttgtaggaaa  32000
gctaagaaaattttgcaaagagcgtacgtgaaaatataagctaggctttg  32050
tggtttgtggatagacttcccaacaaaattgcttttttatctatagtgatc  32100
caagcttgtggaacatattagtcatctttttttagaaaattcttagaaaa  32150
gtgatcttgcaaaaatggaatttatctttccccaagtatattctgtcatg  32200
tatagagttaaactaagcatagtaatttcaccagacaaacattcaaaatc  32250
tactcctgacctttttatctcatccaaatttcccaggcccagacataa  32300
accttgccttacgaactctttgtatatgcactaaatatgcttctcctc  32350
aaggttctcagtcagctagaaaaaatgtgcaagagtaaatggtaccctct  32400
cacttgtagatccaagagaatttagacttaaactcactctacatgtctgtg  32450
actttatttttatttgcatgacagtcctgtgaggtggcaaggcaggtatct  32500
tggatccatttttttagataaggaagttcaaattgagaagaggttgcatga  32550
tttacaggaagccatactgtagtcctatgttacttctaaaaatcccattc  32600
aaatcctgcttctgaggcctgcatacttttctacctaccagtcattgacc  32650
catgcttatgtctcttttgaaaacattgattccactcttgtctccagtga  32700
aaaagtggaatttaagcagagaaacaaaagccatttgtcttgttaagtct  32750
acttttcctctactttcaagaaggaaagttggggtatgtgttgaatggtg  32800
atttatttatttatttattttaaaaattgatacaaggtcttactgta  32850
ttgtgcaggctggtctcaaactcctgggctcaagtgatcatcccacctca  32900
gcctcccagtgttgggattacagcatgaaccattgtgcccaccacgatc  32950
cgcagtttttaagaaaaacttttactatagaaaatttttaatcatatata  33000
aaatacagagggaaagtatatgaacccactttaggagactagaatatgcca  33050
ccccaaaatatgccactttggcataaggattatttcgagctaaaggcaac  33100
tgggaagaaacacatagaagaaagttctctgtccttctccatttgcctca  33150
aaagcaggacatgaatcttaaaagtcccctcctttcctttctacccagga  33200
aaaacaagagttaatcactgaagatcacttcagaccttatcagtgtaga  33250
gatggcactagaagaatctatattacatactcatttatttttcctcccac  33300
aacttgccacccagagactaaaaatccttttccttgtcatgtctcttg  33350
tccaaaaatttgctctataagctggagttctaagccacctctttgagaat  33400
tacttgttcccctggtatttttctgttaacatacatgtattaatatacatgt  33450
taacaagctttctgtttgttttttctcctgttttctgtcttgttacagaggt  33500
ccatcccaactaagaactaaagagtaggaggaaaatataatttcctcctg  33550
catactttgatcttgtttaatccgtaacccttcccactttcacctccta  33600
cctattagattactttgaagcaaatttcagatatattacttttatctataa  33650
atatttcagtatgtgctaggtgtggtggctcacacctgtaatcccaacac  33700
tttgggaagctgaggcaggaggatcacttgagcccaggagttcaagacca  33750
gctacggcaacaaaaaatcaaaaacttatctgggcatggtggcacatgcc  33800
tgtggtcccagctacatgagaggctgaggcaggaggatcgctttagccca  33850
ggaggttgaggctgcagtaagctgcattcacaccactgcactccagcctg  33900
ggtgacagagtaagaccatgtctcaaaaaaaatacatattttagtatgtat  33950
ccttttgtaaaaacacaatacttttatcatactttaaataataacaata  34000
attccttagtatcaccaaatattttgtcagtgtctcacatttttcctttatt  34050
gtctaaaatattgttgatagtttattcaaatcagaatccaaacaaggtcca  34100
tatattacatttggttgacaagtctcttaagtttgttcatctttaagttc  34150
[redacted]  34200
aatttgttctataqtatttcctacattatagagtttgctacatttattcc  34250
ctatgatatcatttagcatgttcctctgtcccctgtgtttcctgtaaact  34300
ggtagttataacctagaaagcttgagtttattcaggtttttaattgtatttt  34350
ttttgcaagaattctttattatctgcttctggaagcacagaatgtctggt  34400
tgtgtctggttttgatcttgacagctactgatgaccattgcctaatccat  34450
tactttattgggggtgggggggaataaggtttttaaaaataaatttttttttaaa  34500
gatttttttaactgttattttgagacagtgtctcatttcgtttcccaggc  34550
tggagtgcagtggcacaatcacggctcactgcagcctttgacctcctgggа  34600
tcaggtgatcttctcacctcagcctcctgggtacctggaactacaggtgc  34650
acaccaccacacctggctaatttttttgtatttttgtgtacagaaggggtttt  34700
```



```
gcaaatgccacataagtgatg[redacted]ccaggactattagcctcggaacctg   37600
aggcagtacagtaagcacgct[redacted]caaagtcctgtccccacagacaa   37650
acattatttacactgggtactgctcttttattttttccccctctatgcttt   37700
attttactataactataatcatataacatgtaatagggaaaaagggcagggt   37750
cgggggagagatccagaagtcttcccaagagccttttccaacatagcctct   37800
gtagacatttttttctttcttctttttttttttttttttttttctgagaca   37850
gagtctcactctgttgtccaggctagagtgcagtggcgtgatctaggctc   37900
actgcaacctccgcctcctgggttcaagcaattctcccacctcagcctcc   37950
ctagtagctgggattagaggcatgcatcaccacgcctggctaatttttgt   38000
attttttagtagagatgaggtttcaccatgttggccaggctggtcttgaac   38050
tcctgacctcaagtgatccacctgccttagcctcccaaagtgctaggatt   38100
acacgagtgagccaccgtgcccctgcccctattcattctgatcacacatt   38150
tcatgttttataattgggaaaactggtgaaattatagacaatgttttgttc   38200
ccctaaattctctttgatgagtatatattacttacactcttctgtcttta   38250
aaatttttgcaaaatagtatcctagataagtttatgagtgcacagtctgta   38300
cgcttactcatattaatgacctcggagagttaaacaacagtcacctttaa   38350
aaattattactatcattatcattatttttgagcggggtctcattctgt   38400
ctcccaggctggagagtagtggtgcggtcacagctcactgcagcctccgc   38450
tacctgggctcaagtgatccttcctcctcagcctttctgagtagctgagac   38500
cacaggcttatgctaccacacctggctaatttttttaacttttttgtagaga   38550
cgatgtctcatttatgttgcccaggctggtctcaaactcctaagctcaagt   38600
gatcttcctcagcctcccaaagtgctgggattacaggcatgaaaaactgc   38650
acccagccctaaaaattattagggtcctgcatagtaagactttaataaat   38700
atttaaatgaacatctggttttttaaaaaaaaaatagagacaaggtctc   38750
actatattgcccaagctggtctcgaactcctggctcacgcaatcctgct   38800
gccttagccgcccaaagtgctgggattacaggcatgagccacctcatctg   38850
ggctgagtgaacatatttttaacataaaggccgtattttatatttatctc   38900
atacattttgcccagcatccccatttccgccgaatctgttgcttgctaat   38950
tcttccagcttcatttcatctgaaatttgacaaacatcttctatttctt   39000
tgtcgtcatgttattgacttcagaatataaaataaaacactatacccaaa   39050
ttaaaccccaccctcattgcccagcctgatgtgaaaataatcagcataca   39100
ttaagcttacccttgatatatgtgtagcatcttttagataaatatacagc   39150
tgattaagcaatatagcctgatggtataatatcttgcccatgtacctcat   39200
cttatctccagcaggattaattcacagtgatcagatttaccttttaaactt   39250
tgtagcaaaatatcctctccaaaagcatatctaaaactttgtgtgtact   39300
cttgcaagtttcttaatttcatgcagaacaggctcttaccactgttagct   39350
ggagatattttcaagacctattttgtttgtggtttcctgatgatggtca   39400
tggcatttccccttcactccatctaaaaattgaggtgatacaggctttt   39450
aaacaaaaccaactcatatagactgagtacaactgcaatgcaggcatgct   39500
aacctctgctacaatcatgggcgtgctattgatatgtcttaagttacaga   39550
acacagggctgagcgtctcattaggtcaaaatgtaaaccagttttctgc   39600
tcactgatgcttaatgaggacagggtgtgagagatttctttaaggaaaac   39650
aaatatataataatgctacatggaaaaatatctaacattagagaattaag   39700
taaataaactaatatactcacaccatggaatcttgtgcagacattaaaat   39750
tatgtagtggatggatgtttaatggtgtggagaaaaagttaggatgtgctg   39800
gggtgggggaagaatcaagttttaagaaaatacagtatacccatacttta   39850
agtaaaaaaaaaaaaaaaggtatgtacagtcatgtgtttgcttaatgatgg   39900
[redacted]   39950
atcatagagtgaacttacacaaacctagatggtctagcctactatgtatc   40000
tagggctatatgactagcctgttgctcctaggttacaaacctgtaagcat   40050
gttactgtagcgaatatacaaatacttaacacaatggcaagctatcattg   40100
tgttaagtagttgtgtatctaaacatatctaaaacatagaaaaatattgt   40150
gttgtgctacaatgttacaatgactatgacattgctaggcaatagaaatt   40200
ataattttatccttttatggaaccacacttatatatgcggtccatggtgg   40250
accaaaacatccttatgtggcatatgactgtatacatgtacacaaaaaat   40300
agatgaaagaatgaatatacatcaaaatatttaaaatggttataatgact   40350
taggttacttttatttatcttagtaataataatgatgatagataatactt   40400
ttatagtgtttactatataaagacactgttataagtgttctacatactt   40450
```



ctttgtcagcaataatatgtga[redacted]gacagattgttagatatgataqtat 43450
aaaaaatggttaatgacaattc[redacted]gcgaggagattctgtaaacttaaa 43500
attactataaatgaaattgatttgtcaagaggataaatttagaaaaacac 43550
ccaataccttataactgtctgttaatgcttgcttttttctctacctttctt 43600
ccttgtttcagttgggaagcttttggctgcaagtaacagaaactcctaat 43650
tcaaatggcttaagcaataaggaaatgtatattcccacataactagacgt 43700
tcaaacaggccaggctccagcacttcagtacgtcaccagggatctgggtt 43750
ctttcccagctctctgctctgccatctttagcgctgccttcattctcagac 43800
tctggtagcatgatggctgtagctgtttcatgggcccctttcaaacctcat 43850
agcaaccagaggaagaaaatgagccatttttgagtctccttcatagact 43900
tgaataactctttttcagagcttctcacagcaaacctctcctcatgtctc 43950
ctcatgtcttattgttcagaaatgggtaatgtgqccatttcaccagtcac 44000
tgccaacaacaacgaggttcctataattgtctctgagtaacccctttggaa 44050
tggagagggtgttggtcagtctacaaactgaacactgcagttctgcgctt 44100
tttaccagtgaaaaaatgtaattatttttccctcttaaggattaatattc 44150
ttcaaatgtatgcctgttatggatataqtatctttaaaatttttttatttt 44200
aatagctttagggqtacacacttttgcttacaqgggtgaattgtgtagt 44250
ggtgaagactcggctttaatgtacttgtcacctgagtgatgtacattgt 44300
acccaataggtaatttttcatccattaccctccttccgccctcttcccctt 44350
ctgagtctccaacatcccttataccactgtgtatgttcttgtgtacctac 44400
agctaagcttccacttataagtgagaacatgcagtatttggttttccatt 44450
cctgagttacttcccttaggataacagccccagttccgtccaagttgct 44500
gcaaaatacattattcttctttatggctgagtaatagtccatggtacata 44550
tataccacattttctttatccacttatcagttgatggacacttagqttaa 44600
ttccattcaatttcattcaatttaagtatatttgtaaggagctaaagctg 44650
aaaattaaattttagatctttcaatactcttaaatttttatatgtaagtgg 44700
tttttatattttcacatttgaaataaagtaatttttataaccttgatatt 44750
gtatgactattcttttagtaatgtaaagcctacagactcctacatttgga 44800
accactagtgtgttgtttcacccctttgttatactatcaggatcctcga 44898

Figure 17

```
                                                                      50
human   MLLRSKPALP PPLMLLLLGP LGPLSPGALP RPAQAQDVVD LDFFTQEPLH
mouse   ----------ML RLLLLWLWGP LGALAQGAPA GTAPTDDVVD LEFYTKEPLR
rat     ---------- -LLLLWLWGR LRALTQGTPA GTAPTKDVVD LEFYTKELFQ

                                                                     100
human   LVSPSFLSVT IDANLATDPR FLILLGSPKL RTLARGLSPA YLRFGGTKTD
mouse   SVSPSFLSIT IDASLATDPR FLTFLGSPRL RALARGLSPA YLRFGGTKTD
rat     SVSPSFLSIT IDASLATDPR FLTFLSSPRL RALSRGLSPA YLRFGGTKTD

                                                                     150
human   FLIFDPKKES TFEERSYWQS QVNQDICKYG SIPPDVEEKL RLEWPYQEQL
mouse   FLIFDPPKEP TSEERSYWKS QVNHDICRSE PVSAAVLRKL QVEWPFQELL
rat     FLIFDPNNEP TSEERSYWQS QDNNDICGSD RVSADVL---- ---------- --

                                                                     200
human   LLREHYQKKF KNSTYSRSSV DVLYTFANCS GLDLIFGLNA LLRTADLQWN
mouse   LLREQYQKEF KNSTYSRSSV DMLYSFAKCS GLDLIFGLNA LLRTPDLRWN
rat     ---------- ---------- ---------- ---------- ----------

                                                                     250
human   SSNAQLLLDY CSSKGYNISW ELGNEPNSFL KKADIFINGS QLGEDYIQLH
mouse   SSNAQLLLDY CSSKGYNISW ELGNEPNSFW KKAHILIDGL QLGEDFVELH
rat     ---------- ---------- ---------- ---------- ----------

                                                                     300
human   KLLRKSTFKN AKLYGPDVGQ PRRKTAKMLK SFLKAGGEVI DSVTWHHYYL
mouse   KLLQRSAFQN AKLYGPDIGQ PRGKTVKLLR SFLKAGGEVI DSLTWHHYYL
rat     ---------- ---------- ---------- ---------- ----------

                                                                     350
human   NGRTATREDF LNPDVLDIFI SSVQKVFQVV ESTRPGKKVW LGETSSAYGG
mouse   NGRIATKEDF LSSDALDTFI LSVQKILKVT KEITPGKKVW LGETSSAYGG
rat     ---------- ---------- ---------- ---------- ----------

                                                                     400
human   GAPLLSDTFA AGFMWLDKLG LSARMGIEVV MRQVFFGAGN YHLVDENFDP
mouse   GAPLLSNTFA AGFMWLDKLG LSAQMGIEVV MRQVFFGAGN YHLVDENFEP
rat     ---------- ---------- ---------- ---------- ----------

                                                                     450
human   LPDYWLSLLF KKLVGTKVLM ASVQGSKRRK LRVYLHCTNT DNPRYKEGDL
mouse   LPDYWLSLLF KKLVGPRVLL SRVKGPDRSK LRVYLHCTNV YHPRYQEGDL
rat     ---------- ---------- ---------- ---------- ----------

                                                                     500
human   TLYAINLHNV TKYLRLPYPF SNKQVDKYLL RPLGPHGLLS KSVQLNGLTL
mouse   TLYVLNLHNV TKHLKVPFPL FRKFVDTYLL KPSGPDGLLS KSVQLNGQIL
rat     ---------- ---------- ---------- ---------- ----------L

                                                                     543
human   KMVDDQTLPP LMEKPLRPGS SLGLPAFSYS FFVIRNAKVA ACI~
mouse   KMVDEQTLPA LTEKPLPAGS ALSLPAFSYG FFVIRNAKIA ACI~
rat     KMVDEQTXPA LTEKPLPAGS SLSVPAFSYG FFVIRNAKIA ACI~
```

Figure 18

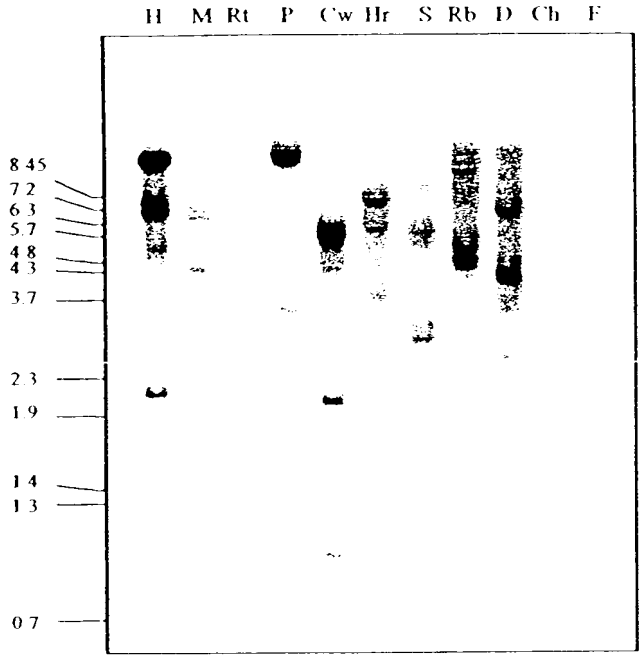


Figure 19

```
     |MLLRSKPALPPPLMLLLLGPLGPLSPGALPRPAQAQDVVDLDFFTQEPLHLVSPSFLSVT|  60
PHD  |                EEEEE                HHH          EEEE     EEE|

     |IDANLATDPRFLILLGSPKLRTLARGLSPAYLRFGGTETDFLIFDPKKESTFEERSYWQS|  120
PHD  |EEE         EEEEE     HHHHHHH     HHHHE      EEEEE          HHHHHHH|

     |QVNQDICKYGSIPPDVEEKLRLEWPYQEQLLLREHYQEKFKNSTYSRSSVDVLYTFANCS|  180
PHD  |HHHHHHHHH        HHHHHHHH    HHHHHHHHHHHHHHHHHH      EEEEEEEEEEE  |

     |GLDLIFGLNALLRTADLQWNSSNAQLLLDYCSSKGYNISWELGNEPNSFLKKADIFINGS|  240
PHD  |  HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH     EEEEE      HHHHHHH EEEE  |

     |QLGEDYIQLHKLLRKSTFKNAKLYGPDVGQPRRKTAKMLKSFLKAGGEVIDSVTWHHYYL|  300
PHD  |    HHHHHHHHHHHHHHHHHH                HHHHHHHHHHHHHH    EEEEEEEEEEE  |

     |NGRTATREDFLNPDVLDIFISSVQKVFQVVESTRPGKKVWLGETSSAYGGGAPLLSDTFA|  360
PHD  |                HHHHHHHHHHHHEEEEEEE      EEEEEE           HHHHHHHH|

     |AGFMWLDKLGLSARMGIEVVMRQVFFGAGNYHLVDENFDPLPDYWLSLLFKKLVGTKVLM|  420
PHD  |HHHHHHHHH    HHHH HHHHHHHHHHHH    EEEEE       HHHHHHHHHHHHH EEEEE|

     |ASVQGSKRRKLRVYLHCTNTDNPRYKEGDLTLYAINLHNVTKYLRLPYPFSNKQVDKYLL|  480
PHD  |EEE     E  EEEEEEEE              EEEEEE       EEEEE       HHHHHHHHH|

     |RPLGPHGLLSKSVQLNGLTLKMVDDQTLPPLMEKPLPPGSSLGLPAFSYSFFVIRNAKVA|  540
PHD  |HH       EEEEEEE    EEEEE                                EEEEEEEE EE  |

      |ACI|                                                              543
PHD   |   |
```